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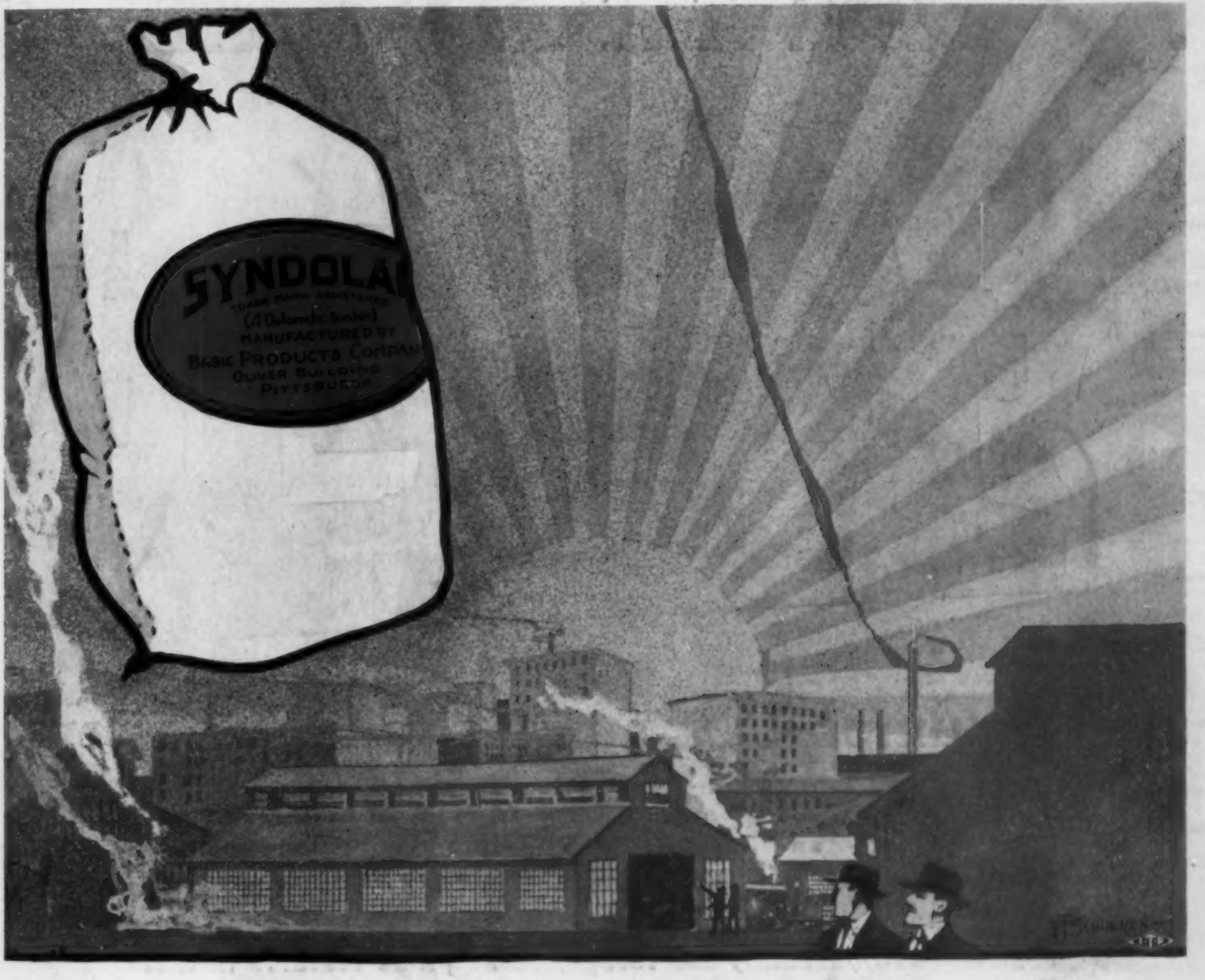

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Advertisers' Index, pages 142-143. Contents, page 63. "Where-to-Buy," page 72.
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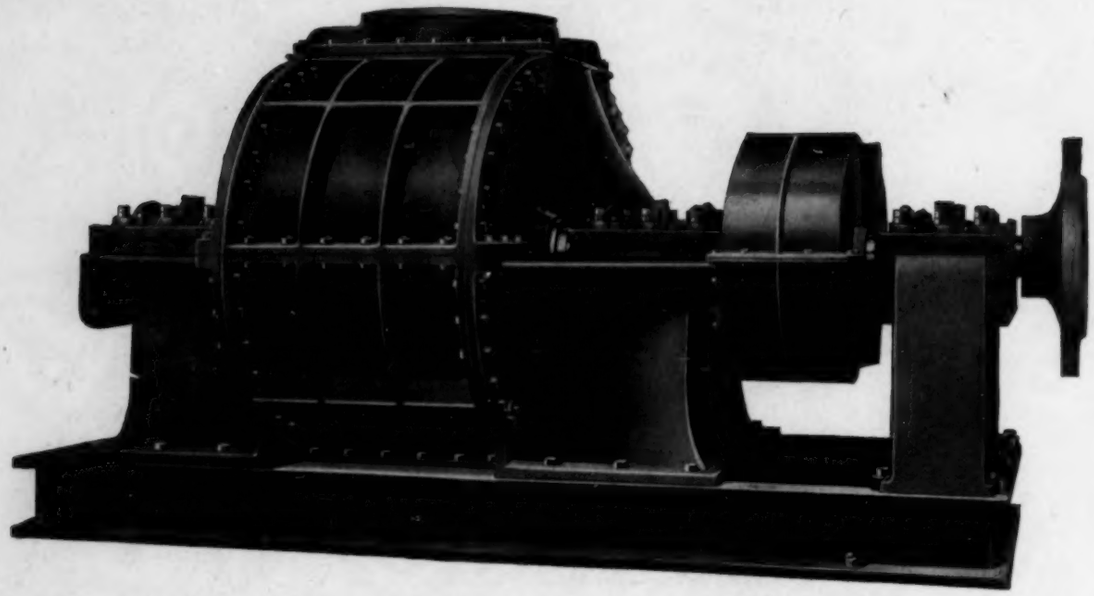

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Say you saw it in THE IRON TRADE REVIEW

THE IRON TRADE REVIEW

Vol. LXI Cleveland, October 18, 1917 *No. 16*

Enormous War Tonnage in Market

Government Proceeds to Distribute 2,500,000 to 3,000,000 Tons of Shell Steel and Huge Requirements for Marine Construction—Incomplete Price Fixing Program Leaves Industry Unsettled—Sales Show Increasing Tendency

CLEARING up of the confused market situation in iron and steel still is far from completion. The week's addition of semifinished material to the fixed list provides a base for all rolled products but leaves in doubt the exact prices in many finished lines. The latest official pronouncement manifestly represents a compromise between conflicting views of the producers and the federal authorities. Both makers and buyers, consequently, are not disposed to resume their normal functions in the market until positive government approval has been affixed to any schedule in which they are directly interested. After the food bill fiasco, which broke up the close participation of business men in war preparations it is interesting that iron and steel makers again are rendering the government the benefit of their advice and experience. This is being accomplished by reverting to the original method of co-operation through the general committee of the American Iron and Steel institute. This committee is acting purely as a representative of the industry which the government is calling into consultation and not as an auxiliary of the national war machine.

Steel Tonnage is Enormous

Now that shell bar prices have been determined, the government is proceeding to make a tremendous distribution of its requirements in this line. It is estimated reliably that such matters upon which action now is being taken will call for from 2,500,000 to 3,000,000 tons of steel. The largest of these involves 6-inch shells, for which from 1,500,000 to 2,000,000 tons alone will be needed. For the navy, 1,000,000 tons, consisting chiefly of plates and shell steel, are in sight. The open requirements of the Emergency Fleet corporation are placed at 2,000,000 to 3,000,000 tons, of which 70 per cent will be plates and 30 per cent shapes. Two of the shipyards which recently received government merchant ship contracts are in the market for 150,000 tons of fabricated material. A new sale of 25,000 tons of ship steel has been made to England.

Private Buyer Faces Problem

The position of the private buyer in obtaining steel continues to grow steadily worse. War business coming forward in constantly growing volume is interfering more and more with shipments to the normal trade against tonnage which long has rested on mill books. One of the large independent producers has been offering certain sizes of steel bars at 2.90c, Pittsburgh, to regular customers. Reinforcing bars rolled from shell discards have been selling at the same figure. An eastern shape mill has been taking business at the 3c, Pittsburgh, price. Such instances, however, are exceptional. Certain plates mill still are booking orders at from 7c to 8c. The suffocation of steel construction work again is brought out by the 29 per cent of fabricating shop capacity booked in September.

Iron Sales Are Heavy

Selling of pig iron at the new prices has gone far ahead of steel, even though the government yet is to announce the awaited schedule of grade differentials. Some estimates in well-informed quarters place the volume of such sales as a matter of several hundred thousand tons. This indicates that business placed has been considerably larger than surface signs disclose. It is understood that the heaviest turnover has been in Pittsburgh and eastern districts. It is known that some furnaces now are willing to accept the government prices through to July 1, 1918, and there have been various sales for the first quarter and beyond.

Coke Shortage More Serious

Some coke is being marketed on a $6, Connellsville, basis, but under conditions of a rather special character. Certain furnaces which prior to the government action were getting their coke from regular sources of a supply on a day-to-day basis, continue to do so, and $6, ovens, now is the settling price under these arrangements. There is virtually no selling in the open market, however. Labor conditions prevent full production.

The Iron Trade Review

EDITORIAL

Government Prices and the Market

THE second installment of steel prices upon which an agreement has been reached by the war industries board and the producers as announced by the President applies entirely to semi-finished forms. These prices represent a logical and necessary extension of the original agreement which covered only the three finished lines of plates, structural shapes and steel bars. They have been settled upon with the controlling idea of permitting all producers to realize some profit from the rolling of plate at 3.25c per pound, structural shapes at 3c per pound, and steel bars at 2.90c per pound whether or not they are producers of their own steel.

The agreed price of $47.50 per gross ton for 4 x 4-inch and larger blooms and billets compares with the fixed figures of $58 per net ton for steel bars and of $60 per net ton for shapes. Allowing 10 per cent loss in conversion, a gross ton of semi-finished steel may be considered for practical purposes to be equivalent to a net ton of finished product. Consequently the margin over the billet prices allowed by the government is $10.50 per ton in the case of steel bars and $12.50 in the case of shapes. This is a very liberal allowance judged by the comparison of market prices in finished and semifinished products over a period of years. In the 10 years from 1906 to 1916, the average market spread between billets and steel bars was $2.78 per ton. Between billets and structural shapes in the same period it was $4.39 per ton. In 1916 the spread between billets and bars was extended to $5.64 per ton, while between billets and shapes it was $7.32. In 1917 to date a phenomenal switch of the market is shown. Instead of the semifinished product being lower in price than the finished, the opposite has been true. The average price of bessemer billets in 1907 was $78.61, Pittsburgh, per gross ton against $69.55, Pittsburgh, per net ton for steel bars and $77.08 for structural shapes. There is no exact comparison to be had between slab and plate prices during the past 10 years. However, the average price of plates in 1916 was approximately $63.50 per net ton and the average price of 4 x 4-inch billets in that period was $43.68 per gross ton. The agreed price of slabs is $50 per gross ton or $12.50 over 4 x 4-inch billets. Following the analogy of the government's price plan of putting slabs at $2.50 per ton above billets this would leave a margin of $17.38 per ton for plates over slabs in 1916. In the government's prices the margin between 3.25c per pound, or $65 a ton for plates and $50 slabs is $15 per ton.

For the conversion of pig iron to steel the government price allows $10.25 in the case of bessemer billets at $47.50, Pittsburgh, over bessemer pig iron at the tentative price of $37.25, Pittsburgh; and $12.75 in the case of slabs. The average margin between bessemer pig iron and bessemer billets for the 10 years of 1906 to 1916 was $7.38. The average spread between bessemer pig iron and bessemer billets for 1916 was $19.78, and for 1917 to date $32.98.

Reduced to tabular form the comparison of price spreads in the government schedules and the market for various periods is as follows:

	Pig Iron to Billets	Billets to Bars	Billets to Shapes
Government schedule	$10.25	$10.50	$12.50
1916 average	19.78	5.64	4.39
1906-1915 average	7.38	2.78	7.32
1917 average	32.98	—9.06	—1.53

To sum up these comparisons it is evident that the government practically eliminated from consideration the price spreads between pig iron and billets and between billets and finished steel in 1917 on the hypothesis that the latter was an abnormal market period, which indeed it was. Taking the basis of market prices for 1916 and for the 10 years preceding, however, it is shown that operations covering the conversion of pig iron to semifinished steel have been dealt with less liberally than from semifinished steel to finished forms. The government spread between pig iron and billets is $9.53 per ton less than the relation between these two products in 1916 though it is $2.87 per ton more than the 10 years average difference up to 1916. On the other hand, between billets and bars the government allowance is $4.86 per ton more than in 1916 and $7.62 per ton more than during the 1906-1915 average; while in shapes it is $5.18 per ton more than in 1916 and $8.11 more than the 10-year average. Considering the relatively smaller margin between billets and bars and between billets and shapes both in 1916 and in the preceding 10 years, the proportionate favoring of finishing operations by the government schedule is all the greater.

1917 Steel Ingot Production

THE production of steel ingots in 1917 is estimated by the American Iron and Steel institute at 42,260,000 tons instead of the 42,600,000 tons given in these columns last week. This figure

The Iron Trade Review

EDITORIAL

compares with an actual production of ingots in 1916 of 41,401,917 tons, giving an increase for this year of 860,000 tons, or about 2 per cent. The institute sets the 1917 production of steel castings at about 1,500,000 tons against 1,371,763 tons last year, giving a total steel production this year of 43,760,000 tons, compared with last year's total of 42,773,680 tons.

Federal Ownership Not the Need

PREDICTION made by the conference committee on national preparedness that the exigencies of the war may force government ownership of American railroads in "the surprisingly near future" expresses a view that is not uncommon. Whether or not it may turn out to be true remains to be seen. It is most difficult to conceive of the consummation of this process of evolution and revolution in the transportation world. Assuredly it is to be earnestly hoped that it will not come to pass.

The unsatisfactory transportation system, both as it applies to railroads and ships, is well known. Yet it is not clear as to how the situation would be improved through government ownership. Rather, it might become demoralized if that alternative were adopted. The government perhaps could not correct existing defects as expeditiously as can the railroads with their established organizations. The government would have to either take over these organizations, by which nothing would be gained, or it would have to build up new organizations. In either event it would increase immensely its already burdensome activities in connection with its war program.

The steel industry is now taxed with war orders and more are constantly being placed. It would no doubt be difficult, if not impossible, for it to make early delivery of the supplies necessary for the required improvements. That in itself is partly due to the faulty transportation system, with a lack of fuel being delivered to furnaces and mills, use of dilapidated locomotives, shortage of cars, etc. Indeed there are well informed men in the trade who say these are contributing elements which are going to result in an extreme shortage of steel next year, and will cause the closing down of many mills and the blowing out of many furnaces. Everything possible should be done to prevent such a situation from developing. It would be a calamity at a time when the nation would be least able to face it.

The railroads should be given any and all aid they need, financial and otherwise, to avert this predicament. That, it seems, is where the government can do most good.

How Much Ore in China?

ARE China's fabled iron ore reserves a myth? For years we have been hearing about the tremendous deposits of the great Asiatic republic. Its wooded hills have been reputed to contain billions of tons of ore, destined to form the foundation of one of the world's greatest iron and steel industries. Much of the active, paternal interest of Japan in China's internal affairs has been ascribed to the desire of the Mikado's subjects to corner the world's last great ore reserve, to the future military glory of the land of the rising sun.

Are the Japanese chasing a will-o'-the-wisp? Is China destined to remain a great importer of iron and steel products for generations to come? These questions are brought to mind by opinions of men familiar with Chinese iron ore deposits voiced at the recent St. Louis meeting of the American Institute of Mining Engineers.

In a discussion of a paper on the Tayeh ore field by Chung Yu Wang, an eminent Chinese metallurgist, T. T. Read, now with the New Jersey Zinc Co., formerly resident in China on iron ore investigations, stated that Chinese ore bodies so far discovered have been disappointing both in quality and quantity. Nothing like a second Mesabi range has been brought to light. One of the most famous holdings contains barely enough ore to fulfill an existing contract with a Japanese steel producer. China may support a considerable iron and steel industry, Mr. Read pointed out, but with the resources in sight it cannot be expected to develop anything exceptional or to rival the United States.

Considering the authority of their source, these statements bear unusual weight. There is no doubt the future course of history hangs on the amount of iron ore available in China. Pharaoh's slaves would have found it easier by far to make bricks without straw than modern civilization to wage war without steel. Without self-contained, available ore reserves no great military power can be built up in the Orient, unless it possesses sufficient naval strength to keep the seas clear for the continuous importation of munitions. Therefore, if the ore deposits of China actually are inadequate to support a great producing industry, the "yellow peril" fades into thin air.

Iron and Steel Prices

Corrected to Wednesday Noon

SCRAP, WAREHOUSE AND IRON ORE PRICES ON PAGE 856

PIG IRON

(Delivery this year.)

Bessemer valley	$36.30
Bessemer, Pittsburgh	37.25
Basic, Pittsburgh	33.95
Basic, eastern Pa.	33.00
Basic, Buffalo	33.00
Malleable, Pittsburgh	34.45
Malleable, Chicago	33.50
*Malleable, Philadelphia	
*Malleable, Buffalo	
*No. 1X, Phila.	35.25
No. 2 foundry, Pittsburgh	33.95
No. 2 foundry, Cleveland	33.95
No. 2 foundry, Ironton	33.00
*No. 1 foundry, Chicago	
No. 2 foundry, Chicago	33.00
No. 2X foundry, Phila.	34.00 to 34.25
No. 2X foundry, N. J. tide.	34.25 to 34.50
No. 2X foundry, Buffalo	33.00
*No. 2 plain, Philadelphia	33.50 to 33.75
*No. 2 plain, N. J. tide	33.75 to 34.00
*No. 2 plain, Buffalo	
*No. 2 southern, Birmingham	
*No. 2 southern, Cincinnati	
*No. 2 southern, Chicago	
*No. 2 southern, Phila. del.	
*No. 2 southern, Cleveland	
*No. 2 southern, N. Y.	
*No. 2 southern, Boston	
*No. 2 south. interior, N. E.	
*No. 2 southern, St. Louis	
*Virginia, No. 2X, furnace	33.50
*Virginia, No. 2X, Phila.	36.25
*Virginia, No. 2X, Jersey City	36.50
*Virginia, No. 2X, Boston	36.75
*Gray forge, eastern Pa.	32.00
Gray forge, Pittsburgh	32.95
*Gray forge, Birmingham	
*Silveries, 8 per cent, furnace	
*Silveries, 8 per cent, Chgo.	
*Low phos. standard, Phila.	
*Low phos. Lebanon furnace	
*Low phos., Pittsburgh	
*Charcoal, Superior, Chicago	
*Charcoal, Superior, Buffalo	
*Charcoal, Birmingham	

COKE

(At the ovens.)

Connellsville furnace	$6.00
*Connellsville foundry, contr.	
*Connellsville foundry	
*Wise county furnace, contr.	
*Wise county foundry, contr.	
*Pocahontas furnace, contr.	
*New River foundry, contr.	
*New River furnace, contr.	

FERRO ALLOYS

Ferromanganese, prompt	$285.00
Ferromanganese, last quar.	285.00
Spiegeleisen, 20 per cent furnace, remainder of year.	69.00 to 72.00
Ferrosilicon, 50 per cent, Pitts.	170.00 to 180.00
Ferrosilicon, 50 per cent, Pitts., 1st quarter	130.00 to 140.00
Bessemer ferrosilicon, 9 per cent.	$64.00
Bessemer ferrosilicon, 10 per cent.	65.00
Bessemer ferrosilicon, 11 per cent.	67.50
Bessemer ferrosilicon, 12 per cent.	70.00
Bessemer ferrosilicon, 13 per cent.	75.00

Ferrosilicon prices at Ashland, Ky., Jackson and New Straitsville, O., furnaces.

SEMI-FINISHED MATERIAL

BILLETS

Open hearth, Pittsburgh	$47.50
Open hearth, Philadelphia	
Open hearth, Youngstown	47.50
Bessemer, Pittsburgh	47.50
Bessemer, Youngstown	47.50
Forging, Pittsburgh	125.00
Forging, Philadelphia	
Forging, Chicago	125.00

SHEET BARS

Open hearth, Pittsburgh	$51.00
Open hearth, Youngstown	51.00
Open hearth, Cleveland	52.00
Bessemer, Pittsburgh	51.00
Bessemer, Youngstown	51.00

WIRE RODS, MUCK BAR, SKELP

Wire rods, Pittsburgh	$57.00
Muck bar, Pittsburgh	85.00 to 90.00
Grooved skelp, Pitts.	2.90c
Sheared skelp, Pitts.	3.25c

*Not determined.

SHAPES, PLATES AND BARS

Structural shapes, Pitts.	3.00c
Structural shapes, Phila.	3.185c
Structural shapes, N. Y.	3.195c
Structural shapes, Chicago.	3.00c
Tank plates, Chicago	3.25c
Tank plates, Pittsburgh	3.25c
Tank plates, Philadelphia.	3.435c
Tank plates, New York	3.445c
Bars, soft steel, Pittsburgh	2.90c
Bars, soft steel, Chicago	2.90c
Bars, soft steel, New York	3.195c
Bars, soft steel, Phila.	3.185c
Cotton ties, Pitts., Sept.	$2.12
Bar iron, Chicago	4.50c to 5.00c
Bar iron, Philadelphia	4.685c to 5.185c
Bar iron, Cleveland	4.50c to 5.00c
Bar iron, New York	4.695c to 5.195c
Bar iron, Pittsburgh	5.25c
Hard steel bars, Chicago.	4.25c to 4.50c

RAILS, TRACK MATERIAL

Angle bars, Pittsburgh, base	3.75c to 4.00c
Angle bars, Chicago, base	3.25c to 4.00c
Standard bessemer rails, mill.	$38.00
Stand. open hearth rails, mill	40.00
Light rails, 25 to 45 lbs., Chic.	70.00
Light rails, 25 to 45 lbs., Pitts.	75.00 to 85.00
Relayers, standard, mill	38.00 to 40.00
Relayers, light, Chicago	60.00
Relaying rails, light, St. L.	65.00 to 68.00
Spikes, railroad, Pittsburgh	6.50c to 7.00c
Spikes, railroad, Chicago	5.00c to 5.25c
Track bolts, Pittsburgh	5.50c to 8.00c
Track bolts, Chicago	5.25c to 6.50c
Tie plates, Chicago	$70.00 to 75.00

WIRE PRODUCTS

(Prices of independent makers.)

(To jobbers; retailers 5 cents more.)

Wire nails, Pittsburgh	$4.00
Coated nails, Pittsburgh	4.00
Plain wire, Pittsburgh	3.95
Galvanized wire, Pittsburgh	4.65
Polished staples, Pittsburgh	4.15
Galvanized staples, Pittsburgh.	4.85
Barb wire, painted, Pittsburgh.	4.15
Barb wire, galvanized, Pitts.	4.85
Cut nails, Pittsburgh	4.50

CHAIN, PILING, STRIP STEEL

Chain, ⅜ in. proof coil, Pitts.	9.00c
Sheet piling, base, Pittsburgh	4.00c to 5.00c

Cold rolled strip steel, hard coils, 1¼ inches and wider by 0.100 inch and heavier, base per 100 pounds, 9.00c to 9.50c.

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SHEETS

(In cents per pound.)

SHEET MILL BLACK.

No. 28, open hearth, Pitts.	8.00c to 9.00c
No. 28, bessemer, Pitts.	8.50c to 9.50c
No. 28, open hearth, Chic.	6.69c to 7.69c

TIN MILL, BLACK

No. 28, open hearth, Pitts.	8.50c to 9.50c
No. 28, bessemer, Pitts.	8.00c to 9.50c

GALVANIZED

No. 28, open hearth, Pitts.	9.25c to 11.00c
No. 28, bessemer, Pitts.	9.25c to 11.00c
No. 28, open hearth, Chic.	8.19c to 8.69c

BLUE ANNEALED

No. 10, open hearth, Pitts.	8.50c to 9.00c
No. 10, bessemer, Pitts.	8.50c to 9.00c
No. 10, open hearth, Chic.	6.19c to 6.69c
No. 10, open hearth, Phila.	

TIN PLATE

(Per 100 lb. box.)

Tin plate, coke base, nom. $10.00 to 15.00

IRON AND STEEL PIPE

(Prices adopted June 18, 1917.)

Steel

Diameter in inches.	Black. Per cent off.	Galv. Per cent off.
¼ to 3, butt	42	28½

Iron.

(Prices adopted June 30, 1917.)

Diameter in inches.	Black. Per cent off.	Galv. Per cent off.
¼ to 1½, butt	33	17

BOILER TUBES

(Price adopted April 2, 1917.)

Steel, 3½ to 4½ inches, l. c. l.	34
Iron, 3½ to 4½ inches, l. c. l.	28

CAST IRON WATER PIPE

(Class B Pipe.)

Four-inch, Chicago	53.50
Six-inch and over, Chicago	50.50
Four-inch, New York	53.50
Six-inch and over, New York	50.50
Four-inch, Birmingham	48.00
Six-in. and over, Birmingham	43.00

Class A pipe is $1 higher than Class B.

HOOPS, BANDS, SHAFTING

Hoops, Pittsburgh	6.00c to 6.50c
Bands, Pittsburgh	6.00c to 6.50c
Shafting, Pittsburgh, carloads	5 off to list

RIVETS

Structural rivets, Pittsburgh.	5.25c
Boiler rivets, Pittsburgh	5.35c
Rivets ⅞ in. and smaller, Pitts.	40 off

NUTS AND BOLTS

(Delivered within 20-cent freight radius.)

CARRIAGE BOLTS

(½ x 6 inches, smaller and shorter.)

Rolled thread	40 off
Cut thread	35 and 2½ off
Larger or longer	25 off

MACHINE BOLTS

(½ x 4 inches, hot pressed nuts.)

Rolled thread	40 and 10 off
Cut thread	40
Larger and longer	30
Cold pressed, semi-finished, hexagon nuts	50 and 10
Gimlet and cone point lag screws	45

NUTS

Hot pressed, square, blank	1.70 off
Hot pressed, square, tapped	1.50 off
Cold pressed, square, blank	1.25 off
Cold pressed, square, tapped	1.00 off
Hot pressed, hexagon, blank	1.50 off
Hot pressed, hexagon, tapped	1.30 off
Cold pressed, hexagon, blank	1.25 off
Cold pressed, hexagon, tapped	1.00 off

Prices Present and Past

(Yesterday, a month ago, three months ago and a year ago.)

Quotations on leading products October 17, average for September, 1917, average for July, 1917, and average for October, 1916. Prices are those ruling in the largest percentage of sales at the dates named

	Prices Oct. 17, 1917.	Average prices Sept., 1917.	July, 1917.	Oct., 1916.
Bessemer pig iron, Pittsburgh..	$37.25	$48.28	$57.95	$24.33
Basic pig iron, Pittsburgh.....	33.95	44.45	53.20	20.83
No. 2 Foundry pig iron, Pitts.	33.95	48.95	55.95	21.08
No. 2 Foundry pig iron, Chic..	33.00	49.50	55.00	19.15
Lake Superior Charcoal, Chicago	35.50*	59.50	59.50	20.35
Malleable, Chicago	33.50	49.50	55.00	19.50
Southern, No. 2, Birmingham..	.....*	43.50	46.00	15.13
Southern Ohio No. 2, Ironton..	33.00	49.50	54.25	19.38
Basic, eastern Pa.....	33.00	49.50	50.75	20.75
No. 2X Virginia, furnace.....	33.50	50.75	52.25	18.50
No. 2X foundry, Philadelphia..	34.25	52.25	54.25	20.75
Ferro mang., delivered.....	285.00	378.00	430.00	162.00
Bessemer billets, Pittsburgh....	47.50	73.75	100.00	45.75
Bessemer sheet bars, Pittsburgh	51.00	82.50	105.00	45.75
Open hearth sheet bars, Pitts..	51.00	82.50	105.00	45.75
Open hearth billets, Pittsburgh.	47.50	73.75	100.00	45.75
Steel bars, Pittsburgh.....	2.90	3.725	3.875	2.60
Steel bars, Chicago.....	2.90	4.10	4.50	2.80
Iron bars, Philadelphia.....	4.935	4.935	4.759	2.659
Iron bars, Cleveland, local del'y	4.60	4.50	4.50	2.55

*Not determined.

	Prices Oct. 17, 1917.	Average prices Sept., 1917.	July, 1917.	Oct., 1916.
Iron bars, Chicago mill.....	$4.50	$4.50	$4.50	$2.35
Beams, Chicago	3.00	4.46	5.88	2.80
Beams, Pittsburgh	3.00	3.75	4.50	2.70
Beams, Philadelphia	3.185	4.435	4.909	2.859
Tank plates, Pittsburgh.....	3.25	6.81	5.63	3.00
Tank plates, Chicago.....	3.25	7.33	9.64	3.19
Tank plates, Philadelphia.....	3.435	7.75	10.159	3.309
Sheets, blk., No. 28, Pittsburgh	9.00	8.75	9.00	3.23
Sheets, blue anld., No. 10, Pitts.	8.50	8.50	8.50	3.13
Sheets, galv., No. 28, Pittsburgh	10.25	9.69	10.25	4.45
Wire nails, Pittsburgh.....	4.00	4.00	4.00	2.63
Connellsville fur. coke.....	6.00	9.63	9.63	3.38
Connellsville fdy. coke, contract	12.50*	12.50	12.38	4.88
Heavy melting steel, Pittsburgh.	30.00	35.50	40.25	17.87
Heavy melting steel, eastern Pa.	26.00	31.25	37.00	15.50
Heavy melting steel, Chicago...	26.50	32.60	35.50	16.50
No. 1 wrought, eastern Pa.....	41.50	44.50	54.00	22.00
No. 1 wrought, Chicago.....	30.00	36.23	39.13	17.50
Rerolling rails, Chicago.....	35.50	41.25	46.25	18.75
Car wheels, Chicago.....	24.50	31.00	36.75	12.25

(For Additional Prices See Page 856)

Pig Iron Sales Reach Large Tonnage

Furnaces in Various Districts Now Are Taking on Business Liberally at Agreed Prices, in Some Cases Through the First Half of 1918—Establishment of Differentials Between Grades Still Pending

Pittsburgh, Oct. 16.—Pig iron tonnages are moving freely in this district at government prices. Deliveries are to be made during the last and first quarters. While as a general thing the individual lots involved are small, some sales represented sizable tonnages. A valley furnace interest closed for 5000 tons of prompt basic at the government price of $33, furnace, with a valley manufacturer. An eastern maker sold 5000 tons of bessemer at the tentative figure of $36.30, furnace. The buyer is understood to be a large consumer in the Pittsburgh district and delivery for this lot is also to be made during the last quarter. Another valley producer has sold about 2000 tons of No. 2 foundry iron at the government figure of $33, furnace, and about an equal lot of No. 3 foundry at the tentative price of $32.50 for first quarter delivery. A small tonnage of malleable iron has been sold by a valley furnace at the provisional price of $33.50, furnace. Another large producer has sold various grades of foundry iron for last and first quarter delivery, involving about 10,000 tons. It is the general policy of producers to sell only to their regular customers. While formal inquiries which have developed since the government began fixing prices on iron have not increased much, a general sounding out of the market is being done quietly. Brokers are enjoying more pig iron business than they did immediately after the price-fixing program was put into effect. Some furnace interests are not hesitating about paying commissions, although they are lower than those allowed previous to the fixing of prices. It is understood that a commission of 1 per cent is being granted by some producers. Others so far have not adopted the policy of paying commissions to brokers. The trade is anxiously waiting for the government to announce differentials on the various grades of iron, on which prices have not been fixed. It is believed that these differentials will be made known within a few days.

Rail Congestion Blocks Shipments

New York, Oct. 16.—The eastern pig iron trade continues to focus its attention upon the negotiations for the establishment of differentials for the various grades of pig iron. Pending the fixing of these differentials, all business now being transacted in this district involves foundry iron. Sales of foundry grades in metropolitan territory during the past week involved fully 3000 tons. Practically all of this business was in small lots ranging from a carload to 200 tons. All these transactions were on the basis of $33, furnace, for No. 2 plain and $33.50, furnace, for No. 2X. Numerous inquiries are pending, including one for 1000 tons of foundry and several of 500 tons each, mostly for this year. Although there has been considerable inquiry for first half, none of the furnaces have shown a disposition to take on commitments for this position. Consequently the inquiry has fallen off. Sales of the week include a small lot of bessemer for Italy which is to be billed at the government price to be fixed on this grade. Considerable congestion has developed on eastern railroads lately, due to movements of troops and troop supplies. The tie-up is so acute on the line of the Norfolk & Western that this railroad now is refusing all consignments of pig iron except for shipment direct to government plants. It even has refused shipments of pig iron to

plants which are making war materials. This embargo is causing iron to back up at some of the Virginia furnaces. Much difficulty also is encountered in shipping pig iron to England, due to an embargo of the New York, New Haven & Hartford railroad.

Basic is Sold Freely

Philadelphia, Oct. 15.—Although business is being held up in the grades of pig iron on which government prices have not yet been established, there is considerable selling in the grades which already have been fixed. Sales of basic aggregated 15,000 tons during the past week, all at $33, furnace, and all for shipment this year. A portion of this iron was taken by an eastern Pennsylvania platemaker. Sales of foundry were numerous, but as a rule were not large, so that not more than 3000 to 4000 tons were involved. Of the total, about 1000 tons is No. 2X for shipment over the first half; this iron was booked by an eastern Pennsylvania maker. All of these sales were on a uniform basis of $33, furnace, for No. 2 plain, $33.50 for No. 2X and $34.50 for No. 1X. The week's business in foundry was participated in by eastern and central Pennsylvania and Virginia furnaces. A round tonnage of standard bessemer was sold during the week, the price to be determined after the government regulates this grade. Numerous inquiries are out for all grades. Although consumptive requirements of pig iron fundamentally are as large as ever, the melt has been curtailed to some extent of late by the shortage of fuel.

Following sales about 10 days ago by a Virginia furnace of some 9000 tons, representing the unsold portion of its 1917 output, another Virginia maker pursued a similar course during the past week. This interest came into the market and withdrew inside of 24 hours, having disposed of all its unsold output for this year. Most of this iron was sold to consumers west of this district.

Buffalo Makes Some Sales

Buffalo, Oct. 16.—Most of the furnaces of the district report very little iron sold during the past week and a small tonnage unsold for the balance of the year. Furnaces are not out after business, but if any customer evinces a desire for iron for 1918 delivery, it is being contracted for with the proviso that it shall be subject to government price revision. The idea in this instance is to take care of regular customers. One local producer reports several sales of tonnages ranging from 400 to 600 during the past week at $33. This grade was No. 2X. A spare tonnage was created because of the fact that one furnace was taken off ferromanganese unexpectedly. This furnace will probably make pig iron for the next 60 days, or until certain ore shipments arrive and permit a resumption on ferromanganese. Some producers are of the idea that there will be an iron shortage after the period of price adjustment. It is believed that there will be a period of first-come-first-served, after which the available iron is likely to slump. They hazard the prediction that the pressure of business may be such as to prevent the carrying out of all orders, even from the regular trade.

Chicago Iron Still Inactive

Chicago, Oct. 16.—Some increase of inquiry for pig iron is noted in this market, malleable and basic being most active. Under present conditions of local furnaces, it is almost impossible to fill these needs but some business of this sort has been placed through local representatives of valley furnaces and other eastern makers. This business has been booked at the government price. Two basic inquiries involve 10,000 and 3000 tons, respectively, and the aggregate of malleable inquiry is between 5000 and 6000 tons well scattered in small lots.

The differentials for silicon above 2.25 are fairly well fixed in the minds of producers and consumers but it does not follow that the settlement of these will help the situation except to provide a figure for application to occasional tonnages above the No. 2 foundry grade. For several months pig iron makers have been avoiding high silicon and for the most part any metal above 2.25 has been accidental. Buyers probably will find a continuation of the present situation that furnaces are unwilling to book excess silicon. Much off iron is being produced on account of poor fuel supply. Much of this is taken by melters on contracts rather than wait for regular analysis. Lake Superior charcoal iron makers are quoting a differential of $2.50 over No. 2 foundry as a working basis, making a quotation of $35.50, furnace. Sales at this figure are subject to revision when the government differential is announced. Furnaces in this district are sold full to the middle of 1918 except for the production of a new stack expected to go in blast in February. Even this addition to production will not offer much tonnage as there is a probability of one or more active stacks being forced to blow out for relining before the middle of 1918. Furthermore, it is probable the government will place some tonnage with Chicago furnaces which will reduce the available supply for present contracts. Local furnaces are receiving some inquiries for iron for delivery during the last half of 1918. Up to the present time this has not resulted in contracts. Buyers appear to be inquiring more to test the market than to actually close.

Some Sizable Sales Made

Cleveland, Oct. 16.—A sale of 2500 tons of bessemer for October-February delivery to the Cleveland plant of the Westinghouse Electric & Mfg. Co., at a tentative price of $36.30, valley, is one of the largest transactions in pig iron to be made at the agreed prices in this district. The Westinghouse Air Brake Co. has taken 3000 tons of foundry and 1000 tons of malleable on an inquiry for 7000 tons. Inquiries are heavy and producers are finding difficulty in taking care of old customers. Various smaller sales also are being closed on $33 base. In some cases the transactions are being closed without formal contracts and by the exchange of correspondence. Invoices are being rendered in blank. Heavy sales also are being made for delivery through the first half, at the fixed price which is not subject to revision. Liberal sales at the new price are being closed, it is understood, from furnaces outside this district controlled by local interests. Inquiry remains more active and a considerable part of this is for next year. A 5000 to 10,000-ton inquiry for basic for a southern Ohio melter remains open. In response to the question raised by holders of high-priced old contracts as to how they are going to come out under present conditions, sellers have been pointing out that the prior position of these consumers on the books will insure them that their needs will be taken care of, whereas this is not certain with present purchasers. Furthermore, emphasis is laid on the probability of an iron shortage. There is no disposition of producers to revise high-priced contracts. Except in one instance, where deliveries were in arrears, there have been no cancellations by buyers. Operations of some of the local foundries are beginning to be threatened by coke shortage.

$33 Alabama Sales Reported

Cincinnati, Oct. 15.—Rumors have been circulated that some of the southern furnaces quietly have agreed to take on a little business at $33, Birmingham, for this year's shipment. A few sales have been made around this figure but the iron was too high in sulphur for ordinary foundry use. The trade is confusing the agreement between Virginia producers

as extending to the Alabama and Tennessee furnaces, and this doubtless is the base for the many reports as to the policy of the latter makers. Virginia iron was sold quite freely at $33 at furnace for No. 2 foundry while it lasted, but the supply in that district for this year's shipment now is very limited as far as standard foundry iron is concerned. Ironton iron of all kinds is too scarce to be a factor and the furnaces there are having a hard time moving what they produce on account of difficulties in securing cars. Some Ohio silvery iron business is being held up due to the inability of the buyer and seller to get together on the price. However, there is not much of this iron to be had and the furnaces are shipping out all they can make on old contracts. As far as new business is concerned both buyers and sellers are playing a waiting game. The melt of foundry iron continues above normal.

Some Selling at St. Louis

St. Louis, Oct. 13.—The market for pig iron here continues uncertain and unsatisfactory. Numerous inquiries are in the market, some of them urgent and in the aggregate heavy, but very little metal is being offered. Toward the end of the week there were signs of loosening, several dealers reporting offerings of several thousand tons. Leading dealers say that until further information relative to grades and general terms is given out there is not likely to be any change in the situation. Southern producers are out of the market at the moment, and cannot be induced to quote. Blast furnaces in this district are sold up well into 1918, and are booking no new business. One sale of 3000 tons to a plant on the east side was reported on Friday, the price being on the government basis. Aside from this, only a few odd lots of under 1000 tons were disposed of. General consumption continues at record levels, and deliveries on contracts are reported satisfactory.

Southern Market Still Waiting

Birmingham, Ala., Oct. 16.—Old contracts still hold the stage in the southern pig iron market and manufacturers are yet waiting for further light on the prices fixed by the government. Production in the meantime is off a little. The Alabama Co., the Shelby Iron Co. and the Tennessee Coal, Iron & Railroad Co. each have a furnace out for repairs. The Birmingham Trussville Iron Co. soon will apply the torch to its furnace a few miles from Birmingham. The Sheffield Coal & Iron Co. still is working on its two furnaces. It will be the latter part of November before iron production in this district will be around the high mark that was reached some time back. There is much discussion as to the government price and its relation to this and other districts. A price of $33, Pittsburgh, is taken to mean to apply to No. 2X, or the equivalent of $33.50, Birmingham, for No. 2 foundry and basic. If any sales have been made at the new price very little is being said about it here. Officials of furnace companies assert that all efforts are being centered on the clearing of books of old business. Raw material supplies are reported not as steady as they might be despite the fact that labor has been advanced. Furnace stocks of iron are about the same. Government certificates for iron are being received in various cases and shipments made.

Coke Needs Grow Serious

Lack of Labor Still Prevents Maximum Production—Various Plants Face Shutdown—Little Selling at $6 Price

Pittsburgh, Oct. 16.—Coke operators, except in rare instances, continue in their refusal to accept new business at the government figure of $6, ovens. They assert that full operations are necessary to take care of contracts. Despite this claim, it is recalled that although they were heavily committed on contracts before the government fixed the price, they readily accepted new business for prompt shipment at the extremely high open market quotations. While most furnaces appear to be comfortably cared for through contracts they had placed before the government action, some of them are suffering from an extreme shortage of fuel, and unless their requirements are met soon, more of them will be compelled to bank. Numerous foundries in this district are also on the verge of having to close down because of their inability to get spot shipments of coke. The situation is becoming so serious that it is believed by some that coke operators either will have to change their attitude voluntarily and accept tonnages at the agreed figure, or the government will be compelled to take over the distribution of their output. Most of the tonnage moving at $6 is being marketed under arrangements between certain operators and furnaces whereby the price of shipments is fixed daily. These arrangements were in effect before the government price was named. The second order of the priority board, giving a 100 per cent car supply to the coke regions, has had but little effect in increasing shipments. This is largely due to the unsatisfactory labor situation, which makes it impossible to produce a supply equal to the shipping capacity. The embargo placed on lake coal shipments apparently has had but little effect in the way of allowing additional tonnages to manufacturing interests in the Pittsburgh and valley districts, the latter suffering especially from a shortage of coal. The embargo was prompted chiefly by reason of the congestion growing out of heavy shipments to the lakes and affecting the Pennsylvania railroad, particularly in its Conway yard. The fuel administration has also ordered bituminous coal companies to provide established allotments for railroads. Coke brokers are hoping that the fuel administration soon will announce its policy as to whether or not commissions will be allowed above the $6 price, or whether it should be paid from that figure by the coke operators. Production in the Connellsville regions for the week ending Oct. 6 totaled 135,500 tons, as compared with 132,732 tons for the preceding week, according to *The Connellsville Courier.*

Few Foundry Sales at $6

Cincinnati, Oct. 15.—It is almost impossible to get quotations on any quantity of either furnace or foundry coke and for any shipment. A few cars are being picked up by foundry consumers in the Connellsville field at $6 plus commission, and the buyers claim that these transactions are almost accidents. The car situation has been improved under the government's recent order but labor conditions are as bad as they have been for a long time past. Special effort is being made to ship coke on contracts. Many foundries rarely have the bottom of their storage bins well covered. The situation is unchanged in the New River, Pocahontas and Wise county fields. No new business is being taken on there. It is impossible for production to get enough ahead to permit the booking of new orders.

Inquiries Fail to Bring Offers

St. Louis, Oct. 13.—Dealers report they are turning down orders for heavy tonnages, being unable to get the ovens to quote prices. Everybody is awaiting definite information from Washington, and until it is known what prices are to be for the various grades,

and what dealers will be allowed to charge, business doubtless will continue at a standstill.

Many brokers here are willing to act as agents for the government, and to supply manufacturers working on war contracts without profit, but they are anxious to know whether or not they will be able to charge a commission over the $6 price for the general run of business. They are not clear as to whether they may ask any commission over $6, and say they are unable to buy under that price.

Big Car Orders

For Russia and United States Expected To Be Closed This Week

New York, Oct. 16.—Awards of 30,000 cars and a large number of locomotives for Russia are expected to be made in Washington this week on bids which went in last Thursday. In addition to government orders reported last week, the Magor Car Co. has taken 450 gondolas for the United States military railways in France.

Sales of small lots of open-hearth rails in all cases, involving less than 100 tons each, have been made in this district during the past week at prices varying between $80 and $90, mill.

Big Car Allotment to be Made

Pittsburgh, Oct. 16.—Orders for 10,000 additional freight cars of various types, including tank, flat and side cars, to be used in France, are expected to be distributed this week. This order will be in addition to that for 4800 narrow gage cars distributed last week. Expeditious delivery of these cars will not be asked and this will be governed largely by available shipping facilities.

Move to Larger Quarters

The Aborn Steel Co., Inc., New York City, formerly located at 105 Leroy street, has moved to its new warehouse and office building, just completed, at 22 Clarke street. The business of this company has grown so rapidly during the past few years that larger facilities became necessary. The company carries stocks of high-speed steel, carbon tool steel, music wire, drill rods, alloy steels, cold drawn and rolled steel, shafting, etc. The officers of the company are: President and treasurer, J. T. Slingsby; vice president, H. Ross Stingsby; secretary, J. Giegerich; assistant secretary, R. W. Pilger. Branch offices are located at Rochester, New York and Philadelphia, the former in charge of R. J. Miller, and the latter of W. P. Cubler.

Shell Steel Needs Huge

Government Now Distributing Orders for Munitions Calling for 2,500,000 to 3,000,000 Tons of Large Rounds

New York, Oct. 17.—Tremendous quantities of shell steel, aggregating approximately 2,500,000 to 3,000,000 tons, are being placed or are about to be distributed by the government. This distribution is in line with the huge requirements for large shells referred to by THE IRON TRADE REVIEW in its last week's issue. The principal item upon which government action is expected within a few days covers 6-inch shells. For this purpose from 1,500,000 to 2,000,000 tons of rough forgings made from 5 x 5½-inch billets will be required. It is expected the companies which will participate in this large order for munitions will include the American Brake Shoe & Foundry Co., the American Car & Foundry Co., the E. W. Bliss & Co., the American Rolling Mill Co., the Portsmouth Steel Co., and the Pressed Steel Car Co., Pittsburgh. In addition to the rough shell forgings required about 350,000 tons of steel will be used for the component parts of these shells and will be placed later. Another large order about to be distributed calls for 32,000,000 rounds of 3-inch shells. This will require about 350,000 to 400,000 tons of 3⅛-inch rounds. A western steel manufacturer has just taken an order from the government calling for 7200 tons of 8-inch shell steel. These bars will be rolled from 6 11/16 round edge billets and will be forwarded to a Cleveland company which will turn out the finished product. This order calls for about 80,000 shells.

Billets and Sheet Bars Inactive

Pittsburgh, Oct. 16.—No sales of billets and sheet bars at the government prices of $47.50 on 4 x 4 billets and $51 on sheet bars, Pittsburgh and Youngstown, have been made in this district. Producers are not seeking business on this basis and it appears unlikely that they will do so during the remainder of the year. The reduced levels have increased inquiries somewhat, but makers are engaged in filling old contracts and are not showing interest in new business. The prices fixed by the government on both products are somewhat lower than it had been expected but the trade has accepted them in a good spirit. Reduction to $57, Pittsburgh, on wire rods made by the government was greater than looked for. The open market quotations on high carbon rods ranged from $90 to $95 and on soft basic from $80 to $85, and sales at these figures were being made up to the time that the government fixed its level. No contracts at the government price have been reported, although inquiries are fairly numerous.

More Inquiry, No Sales

Cleveland, Oct. 16.—No sales of billets or sheet bars at the new fixed prices have been reported in this district. Some of the makers state they have so much government steel to supply by Jan. 1 that they have nothing to offer. Considerable new inquiry has been brought out by the announcement of the agreed prices. Several thousand tons of sheet bars for this years and in one case for delivery up to March, have been asked for. A lot of 1500 tons of forging billets for a northern Ohio consumer again has appeared. Urgent demand is being made upon the mills for forging steel and other material by plants which are building the liberty aircraft motor and every effort is being made to expedite these shipments. On small lots of forging billets from stock, around 5c per pound still was quoted this week.

Strip Steel is Quiet

Pittsburgh, Oct. 16.—Makers of cold rolled strip steel report that no new business of importance for domestic use is being taken. Government contracts are large and call for heavy mill operations. Inquiries are being received steadily, but manufacturers are unable to meet requirements where early delivery is asked. It is assumed that the government will announce a price soon on cold rolled strip steel.

Takes Big Motor Order

The aircraft production board has awarded to the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., a contract for 3500 airplane motors. A new plant is to be built at Swissdale, Pa., to have a capacity of about 600 motors a month. Details of the type of motor to be built are being withheld, but it is understood that the contract does not call for motors of the Liberty motor type.

Some Offers of 2.90c Bars

Some Mills Take Contracts for Certain Sizes—Reinforcing Bars From Shell Stock Also Being Entered

Chicago, Oct. 16.—Although generally the steel bar market is inactive, due to the unwillingness of sellers to take on long-time contracts until the volume of government requirements is better known, an eastern independent has begun to take contracts for certain sizes of bars for delivery this year at 2.90c, Pittsburgh, or 3.105c, Chicago. These orders are accepted only from regular customers and for sizes which can be fitted into the rolling schedule without inconvenience. This business does not extend into next year. Considerably more inquiry is being received for bar iron, but much of this is of a tentative character and buying is not following the inquiry. Makers are not yet quoting for first half delivery, expecting that the government-fixed price will be announced before the end of the year. Hard steel bars rerolled from rails continue to be quoted at 4.25c to 4.50c, Chicago, with only small tonnages being sold. Agricultural implement makers have been inquiring recently for supplies of bar iron and hard steel bars for first half of next year, but desire to have their contracts made subject to the agreed price which the government is expected to set shortly. No contracts on this basis are known to have been made.

Wants Bars for Airplanes

New York, Oct. 16.—The J. G. White Engineering Corp. during the past week has put out several inquiries for bar stock for the aircraft division of the government. The material wanted involves mainly small sizes and it includes up to 1½-inch rounds. About 1000 tons are called for altogether. The only bars which have been offered at the new 2.90c, Pittsburgh, price in this district are hard bars made from rerolling rails or from shell discards. Several moderate-sized tonnages of this stock have been sold during the past week.

Tire Steel is Placed

Cleveland, Oct. 16.—Further lots of tire steel for army wagons are coming up. One of these amounting to 600 tons has been closed, and another of about 750 tons still is in the market. Builders of pleasure automobiles continue to cut down their specifications for steel. With one or two exceptions, the falling off in demand is forcing them to reduce their operations. Some builders in this district, however, who are manufacturing trucks partially for war use, are doing fairly well. War business continues to grow. Some plants which are taking orders of this kind are applying to them steel which they previously had specified with the mills for their regular nonwar needs. This substitution is facilitating delivery. Obligations of the mills are so heavy that they are turning down tonnages from regular consumers for nonmilitary purposes, especially where the latter still have considerable undelivered steel on the books. The 300 to 400 tons of rivets for the standardized naval boilers recently awarded are being distributed. Rivets show an easier tone in sympathy with the lower bar prices. Reinforcing bars are softer with 3.75c to 4c, mill, quoted and lower reported.

Sells Reinforcing at 2.90c

Philadelphia, Oct. 15.—The first sale of steel bars at the new 2.90c, Pittsburgh, base, other than to the government, was made during the past week by an eastern Pennsylvania mill. This comprised a tonnage of concrete reinforcing bars, rolled from shell discard steel. Otherwise the steel bar market was uneventful. Iron bars are in good demand. Among current inquiries is one from the Merchant Shipbuilding Corp. for several carloads of bar mill specifications. Iron bars may be quoted at 4.50c to 4.75c, Pittsburgh.

No New Business in Bars

Pittsburgh, Oct. 16.—Makers of soft steel bars are not accepting new business at the government figure of 2.90c, Pittsburgh. Domestic consumers realizing the position of manufacturers who are well booked on contracts are not putting out inquiries as freely as they did immediately after the government prices were established.

Shafting Specifications Heavy

Pittsburgh, Oct. 16.—Specifications against contracts for shafting are heavy but not much new business aside from that placed by the government is being taken. Discounts remain unchanged.

Selling Nuts and Bolts

Pittsburgh, Oct. 16.—Makers of nuts, bolts and rivets continue to accept considerable new business for domestic consumption. Many of the buyers taking tonnages are engaged in government work and orders placed by them, as well as contracts directly placed by the government, dominate the market. The slight adjustment recently made in prices on nuts and bolts has had no effect on the market.

Pipe Price Cut

By Eastern Makers $9 Per Ton Following Action in West

New York, Oct. 16.—Following the recent establishment of coke and pig iron prices at the new government levels, cast iron pipe makers generally have adopted a lower level on their product. As a result, prices on pipe which were reduced in the west week before last, have been lowered here during the past week by approximately $9 per ton. The new level is $56.50, New York, on 6-inch, class B, and $59.50, New York, on 4-inch, class B. Although it is reported that the navy department is taking bids on 150,000 feet of cast iron pipe for Norfolk, 1600 feet for Puget Sound, and 18,160 feet for various other navy yards, this business has not yet been brought to the attention of the leading eastern

Mills are Kept Busy

Pittsburgh, Oct. 16.—Pipe mills in this district are operating heavily on contracts and are not in a position to accept new tonnages for prompt delivery. Because of this condition, prices to be announced by the government will have no immediate effect on the trade so far as domestic business is concerned. Manufacturers are anxious, however, that prices be fixed so that the existing uncertainty will be brought to an end. The prices of 2.90c and 3.25c, Pittsburgh, fixed by the government for groove skelp and sheared skelp, respectively, line up with the levels that have been named for soft steel bars and plates.

Southern Shops Don't Need Orders

Birmingham, Ala., Oct. 16.—While cast iron pipe prices have been reduced $15 per ton, to $45 per ton for 6-inch, there is no lowering of operations at the various plants in this district. Nor has any demand been stimulated. The reduction is in line with that in pig iron, steel and kindred products. The National Cast Iron Pipe Co., producing 250 tons per day, has orders in hand to warrant full operations for several months. The American Cast Iron Pipe Co. also is well supplied with bookings. The United States Cast Iron Pipe & Foundry Co. has just completed shipment of 3500 tons of 6-inch pipe to France,

Plate Prices Still Vary

Smaller Mills Continue to Sell at 7.50c to 8c—Government Wants 50,000 Tons for More Cars

Philadelphia, Oct. 15.—That all plate makers are not observing the 3.25c, Pittsburgh, price appears to be borne out by reports that some of the smaller eastern Pennsylvania mills still are offering at 7c to 8c. In fact, a buyer reports that during the past week he has purchased a small tonnage from one of these interests at 8c. The larger makers strictly are observing the arrangement with the government, so far as observing 3.25c as the maximum, but they are not taking on any new business. Numerous inquiries have come out from consumers during the week, but practically all of them remain unclosed. The mills already have on their books enough government work to keep them busy several months, so that other requirements are delayed indefinitely.

Still Quote Plates High

Cleveland, Oct. 16.—Some of the plate mills continue to name practically the same prices that were quoted before the government schedule in this product appeared. Some of these makers are quoting 7.50c to 8c, mill, and are promising comparatively early shipment. There is an unconfirmed report that the government will not be so insistent that certain makers who buy their steel observe the 3.25c price until they have worked off some of their high-cost semifinished material. Stock plates are being quoted at 10c, mill, by some makers.

Selling Absent at Chicago

Chicago, Oct. 16.—In spite of a government price for steel plates being set at 3.25c, Chicago, offers have been made recently by plate consumers of 8c to 10c, Chicago, for immediate delivery material. So far as known no business has been taken by the mills as the result of these offers. These conditions indicate the strong need of further immediate tonnages of plates on the part of consumers and the inability of the mills to furnish material other than to the government and to holders of former contracts.

Government Wants Much Tonnage

Pittsburgh, Oct. 16.—Huge tonnages of plates are being asked for by the government in the quickest time possible, particularly by the navy department and the Emergency Fleet corporation. Large tonnages are also involved in car orders that have been placed by the war department. For 10,000 more cars of the various types, including tank, flat and side cars, for use in France, which are to be distributed this week, approximately 50,000 tons of plates will be needed. Inquiries for plates continue to be made by domestic consumers, but producers are not taking new business at the agreed figure of 3.25c, inasmuch as the are heavily committed on contracts, most of them placed by the government.

Sheet Prices Still Open

Reported Original Recommendations of Makers Were Unsatisfactory Because Based on $60 Sheet Bars—Big Tonnage Placed

Youngstown, O., Oct. 17.—Sheet prices formulated the second time by the sheet committee were recently presented to the government for approval. It is stated from good authority that the government is as yet not satisfied with the prices presented and that the sheet committee again has been called into conference at Washington. When the first prices were submitted to the government they were based on $60 sheet bars and a figure of 6c was placed on No. 28 black sheets. Since the sheet bar price was set at $51 it is now expected that black sheets will be placed between 5.10c and 5.35c. If the price is set at 5c the scale of wages will be threatened according to the agreement existing among the valley sheetmakers. Blue annealed sheets, No. 10 gage, and black, No. 28 gage, can be bought in this territory around 7c. Galvanized No. 28 gage also is available at 8.50c to 8.75c. Producers state that while not filled entirely for the fourth quarter, they are well satisfied with business already on their books. The mills still are working on government orders allotted some time ago. These include larger tonnages for heavy galvanized sheets for the outer construction of submarine hulls. Inquiries from the domestic trade are many but buyers continue to hold off in view of future prices. Light tonnages are being closed at the quoted prices with the understanding that these sales are bona fide. Sales managers are in a dilemma as to how to handle the new business expected following the fixing of sheet prices.

Expect New Price Soon

Pittsburgh, Oct. 16.—With the government having named a price on sheet bars, it is expected that a level for sheets will be announced by it soon. The figure of $51, Pittsburgh and Youngstown, fixed for sheet bars has naturally led to considerable conjecture as to what the levels on sheets may be. It is presumed that a figure will be named on No. 28 gage black sheets and differentials on the other grades based upon it. New business taken by sheet manufacturers continues to be extremely limited and the small tonnages that are being accepted as a general thing are taken from stocks. Producers are operating heavily on contracts, with those placed by the government dominating the situation. Requirements placed for war needs indicate that the domestic trade will be unable to obtain all of its requirements.

Big Tonnage is Placed

Philadelphia, Oct. 15.—Orders for sheets totaling between 9000 and 11,000 tons are understood to have been distributed by one of the departments of the government during the past week. Practically all the makers received their share. This constituted about all the business placed this week as far as this district is concerned. Small tonnages of sheets have been offered here by western makers during the past week at 6c for No. 28 gage black, 6.25c for No. 10 gage blue annealed and 8c for No. 28 gage galvanized.

Prices Are Sliding

Chicago, Oct. 16.—Prices on steel sheets are distinctly lower, following the fixing of an agreed price on sheet bars. It is expected that the definite figure will be announced by the government shortly on all grades of sheets and this is likely to be lower than the present figure. Speaking roughly, it may be said that No. 10 gage blue annealed may be obtained now from 6c upward, No. 28 gage black at 6.50c upward, and No. 28 gage galvanized at 8c upward. The market is irregular and quotations represent a fairly wide spread. Consumers are keeping out of the market except where immediate necessity is strong and probably will not buy freely until the government has announced a fixed price.

Lettings Still Slumping

September Record Shows Only 29 Per Cent of Capacity Closed —Tremendous Fabricated Tonnage Wanted for Ships

New York, Oct. 15.—Only 29 per cent of the entire capacity of the bridge and structural shops of the country was contracted for during September. This is the lowest monthly booking in recent years, excepting November, 1914, which was 20 per cent. This 29 per cent was equivalent to 52,200 tons and compares with 38 per cent or 68,400 tons in August. Following is a table showing comparison of figures of the Bridge Builders and Structural society:

Month	Per cent	Approx. tonnage
September, 1917	29	52,200
August	38	68,400
July	41½	74,400
June	47½	85,500
May	56½	102,000
April	61	110,000
March	68	122,000
February	59	106,000
January	61½	119,000
December, 1916	86	148,000
November	78	134,000
October	77	133,500
September	52½	99,400
August	64	112,600
July	47½	83,600
June	58	100,000
May	80	137,000

Ship Tonnage is Tremendous

Tremendous tonnages of fabricated stel for merchant ship construction for the government and its allies continue in the market. Two domestic builders are negotiating for 150,000 tons. A sale of 25,000 tons has been made to England. Awards on the 69,000 tons of fabricated steel required for the 50 vessels to be built by the Submarine Boat Corp. at Bayonne, N. J., for the Emergency Fleet corporation are expected to be made within the next few days. Several fabricators are understood to have received verbal assurances of the tonnage they are to furnish. The requirements are 1380 tons of steel for each vessel, of which 400 to 500 tons are shapes and the remainder plates. Inasmuch as the steel for these vessels will be furnished by the Emergency Fleet corporation, the fabricators in submitting quotations have based them on the new government steel prices, plus their fabricating charges. The eastern shape mill which last week was reported to be offering tonnage at the new 3c, Pittsburgh, price, has submitted this quotation on a large number of inquiries during the past week. Only a few sales actually were closed, however, since now that the price has been fixed buyers are not in such haste to close. Offers made during the week were principally on special sections although some standard shapes also were offered. The latter are sold up much farther ahead than the former.

Taking Specials at 3c

Philadelphia, Oct. 15.—A leading eastern shape mill is accepting small orders for special sections at the new 3c, Pittsburgh, price, plus the usual extras. So far it has made no quotations on standard sections. Shape inquiries continue of fair proportions, but owing to the lack of sellers of standard shapes, most of them cannot be closed. A Pittsburgh mill has taken a contract for 850 tons of structural material for an aircraft plant at the Philadelphia navy yard.

Fabricators Unable to Get Tonnages

Pittsburgh, Oct. 16.—Fabricators are unable to get shape tonnages at the government figure of 3c, excepting for contracts for war needs. Manufacturers are operating heavily on contracts and moreover deliveries to domestic consumers which in many instances have been considerably deferred, are becoming more uncertain. Commercial operations are today placed in a secondary position, more than ever before. It is understood, however, that some producers soon may find themselves in a position to supply limited tonnages for domestic use at the government figure.

Bridge Work Put Out

Cleveland, Oct. 16.—Inquiries for about 5000 tons of bridge work have appeared from several railroads in this district. Some of this steel is for specific jobs and some for 1918 requirements. Rush jobs connected with government work are coming out from time to time. On one of these involving 1200 tons, fabrication has been promised in four weeks. None of the shape mills are quoting the 3c price in the open market in this district.

CONTRACTS AWARDED

Plant at Niagara Falls, N. Y., for the Hydro-Fats, Inc., 300 tons, to the John W. Cowper Co.

Paint shop at Mare Island, Cal., for the United States government, 203 tons, to independent shop.

Bridges for Pennsylvania railroad, 500 tons to American Bridge Co., 200 tons to independent fabricators.

CONTRACTS PENDING

Alterations to the old eighth regiment armory, New York, bids to be taken Oct. 23 by Architects Pilcher and Tachau.

Buildings at Watervliet Arsenal, 2500 to 3000 tons, general contract let to Fred T. Ley & Co., Springfield, Mass.

Power house and machine shop for government, at New London, Conn., 600 tons, bids to be opened Oct. 22.

Sagging Market

Still Shown in Ferroalloys as Price-Fixing Remains in Prospect

New York, Oct. 16.—While considerable interest is displayed as to the possibilities of price fixing on ferroalloys, nothing yet has developed in this direction. In general, however, these products reflect the downward tendency which has been general in the iron and steel market of late, due in most cases to price fixing. Then, too, makers of ferroalloys in many cases are anxious to sell owing to their desire, in case price regulation of their products materializes, to have as much business on their books as possible. This attitude has resulted in considerable competition for the limited amount of business that is offered. In ferromanganese, for instance, several small sales have been made during the week at $285, delivered, and this figure now indicates the market for the rest of this year.

Spiegeleisen also has sagged off and now may be quoted at $69 to $71, furnace, on which basis several sales have been made during the past week. Two inquiries previously noted, involving an aggregate of 4000 tons for shipment over the rest of this year, still are pending, and much interest is felt as to the prices at which they will be closed.

A few carloads of 50 per cent ferrosilicon for spot shipment have been sold during the week at $175 and this figure indicates the market.

Market Continues Easier

Pittsburgh, Oct. 16.—While the market for ferroalloys in this district is extremely quiet, small tonnages accepted by the furnaces show continued declines in prices. Ferromanganese for prompt shipment can be bought as low as $325, it is understood, while 50 per cent ferrosilicon seems quotable at $160 and $170. Twenty per cent spiegeleisen for prompt delivery probably can be had from $70 to $75. Prompt 10 per cent ferrosilicon is quotable at $65 and 13 per cent at $75. Producers expect the government to announce prices on high silicon iron soon.

The Coeur d'Alene Hardware & Foundry Co., of Wallace, Idaho, has increased its capital from $500,000 to $1,000,000.

To Discuss Scrap Prices

National Meeting of Dealers Called at Pittsburgh This Week—Government Action on Prices Generally Expected

COMPLETE SCRAP PRICES ON PAGE 856

Pittsburgh, Oct. 16.—Discussion of the fixing of prices by the government on old material will take place at a meeting of the American Board of Scrap Iron Dealers, to be held at the Fort Pitt hotel, Pittsburgh, next Saturday afternoon. Dealers from all sections of the country will be present and in addition to taking up the price-fixing question, will discuss other matters of vital importance to the trade. While at first there was considerable doubt that the government would fix a price on scrap, there is now a well defined feeling that it will do so. The general assumption seems to be that a price will be fixed for heavy melting steel and that differentials for other grades will be based on ths figure. Heavy melting steel is now being offered at from $30 to $31 by dealers. Some dealers are urging that the price of heavy melting be fixed at about $35, but it is thought that this is much higher than will be allowed by the government, the figure generally discussed in this connection ranging from $25 to $27.50. The market is extremely quiet, but chiefly due to the price-fixing program of the government, is considerably easier.

Waiting for Price Action

New York, Oct. 16.—As one local dealer puts it, the iron and steel scrap market continues dull pending action on the establishment of government prices. Owing to the existing uncertainty as to what this action will be and what prices will result, there is a disposition to postpone buying as much as possible. Business during the past week, therefore, has been small. Rolling mill and foundry grades reflect sales of a few carloads here and there. In steel works scrap, however, although there has been some inquiry, actual buying is lacking. Prices are down $1 on heavy melting steel and cast borings and turnings.

Further Readjustment in East

Philadelphia, Oct. 15.—Restriction of demand to small prompt requirements and insistence by consumers on lower prices, greatly facilitated during the past week the further readjustment of the scrap market in this district. The greatest decline is in rerolling rails which after being quoted nominally for some time at $41 to $43, now are held at $28 to $32. Steel shafting and railroad wrought declined $3.50, heavy cast and malleable $2, and there was a weaker tone throughout the list. While heavy melting steel still is quoted at $25 to $27, this grade is weak and the highest offer now is $25. Sales of steel during the week totaled only a few carloads. For wrought scrap there is a good demand in small lots. Foundry grades are exceedingly dull.

Guessing At Fixed Price

Buffalo, Oct. 16.—In view of the fact that government price action in scrap is expected within the next week by dealers here, little business is being done. The general impression is now that heavy melting steel will be fixed at $30 instead of $25 or $28, as some consumers and dealers thought last week. The price of $30 will apply to consuming points, it is thought. The fact that consumers' stocks have been depleted considerably in this district should make for considerable buying when the price is fixed. One large consumer in this district is said to have been offering $28 within the past few days but no sales of any size have been made at this figure. There are a number of large orders for heavy melting steel on the books at $35 to $38, extending to the first of January. Some of the mills are being handicapped by the fact that dealers have not filled orders placed as far back as last February when heavy melting steel was selling around $20. The dealers say that the embargoes and car shortages are principally to blame. An embargo again has been placed against Monessen, Pa. Practically all shipping points require a personal permit. With the further handicap of labor shortage, shipments are at a minimum. Dealers are experiencing great difficulty in securing yard men for $3 a day. An increased demand for turnings and borings for blast furnace use has been connected with talk of an ore shortage this winter.

Rejections on the Increase

Cleveland, Oct. 15.—Still uncertain as to what the outcome will be, consumers, producers and dealers alike anxiously are awaiting definite news from Washington as to government action in scrap. It is reported here that the problem is proving to be one of the most puzzling the government and the committees have tackled. It is said that $30 first was suggested to the war industries board and that this figure was sent back to the committee as being too high. Something like $25 or less is expected. Rejections by consumers are on the increase in this territory. Dealers claim that in many cases consumers are rejecting carloads of first class material bought at the recent high prices in order to take advantage of the lower figures expected. Most prices are nominal. No. 1 busheling, however, has dropped from $24 to $25, to $22.25; cast borings, which were $16.50 to $17, are $16 to $16.50; machine shop turnings have been reduced 50 cents to $15.75 to $16; No. 1 machine cast is $1 lower, or $22.50 to $23.50—all per net ton. Heavy melting steel is quoted nominally at $26.75 to $27.50 a gross ton.

Chicago Market Quiet

Chicago, Oct. 16.—Practically no activity is being exhibited in the scrap iron and steel market in Chicago. Consumers are remaining entirely out of the market and most transactions are between dealers covering on short sales. Under these circumstances, quotations are declining steadily and the general average of the list is considerably lower than a fortnight ago. Expectation that a steelmaker will enter the market shortly for considerable tonnage seems to have stopped the decline on heavy grades. Placing of a fairly large tonnage of these grades probably would have the effect of stiffening prices sharply. Railroad offerings are not being made in the usual volume, either from lack of labor or of shipping equipment. The Northern Pacific has issued a list carrying 5300 tons, the Soo Line 1030 tons, the Chicago & Eastern Illinois 400 tons, and the Monon Route 270 tons.

Market Remains Demoralized

St. Louis, Oct. 16.—The market for iron and steel scrap here continues in a demoralized state. Prices largely are nominal. Uncertainty is the dominant note in the situation, and widely divergent views are held by the dealers and consumers. Principal melters incline strongly to the belief that the market will work lower, while dealers take entirely the opposite position. Meanwhile there is virtually nothing changing hands. Rejections by mills are rather heavy. It is a notable fact, however, that reserves are being rapidly absorbed, and it is only a matter of days before buying must be re-

sumed. Relaying rails have held their own throughout the recent slump. The demand for this material still far exceeds the supply. Offerings from all quarters are light and the carriers are apparently making no effort to move and market their scrap. The only railroad offerings before the market during the week were as follows: Cleveland, Cincinnati, Chicago & St. Louis, 2150 tons; Pere Marquette, 900 tons; Missouri, Kansas & Texas, 800 tons, and the San Antonio & Aransas Pass, 450 tons.

Dealers Are Confused

Cincinnati, Oct. 15.—The market still is declining. The proposed governmental regulation of scrap prices naturally has placed the dealers in a position where they neither know what to pay for scrap nor at what price to sell it. As a consequence transactions are very few. Wrought scrap seems to be weaker than cast. Offerings are light, especially from the railroads which are consuming all of their own scrap that it is possible to use.

Market in South Unsettled

Birmingham, Ala., Oct. 16.—The southern scrap iron and steel market still is unsettled and weak. Quoted prices are considerably at variance. There are large stocks of scrap in hand and old contracts are being filled steadily. Consumption is as heavy as it has been but cast iron pipe and steel producers say that there must be reduced prices in all old material, since their own product has been materially reduced. Transportation troubles still are a factor and some embargoes are in effect. The concensus of opinion in the market is that scrap buying is not likely to be resumed until the pig iron and steel markets are settled. The larger consumers of scrap show a desire to make prices themselves, and as far as can be learned, are getting all the old material they need.

Starts New Plate Mill

With President James A. Farrell, of the United States Steel Corp., pressing the button, the electrically driven 110-inch plate mill at the Homestead works of the Carnegie Steel Co. was put in operation Oct. 17. The first fire in the mill was lighted by Mr. Farrell's daughter. This mill will have a capacity of 15,000 tons per month and for the present will be engaged in producing tonnage for the United States government. Remarkable time was made in building and placing the mill in operation. It was authorized on April 17 of the present year and, therefore, will begin producing just six months to the day after the authorization had been made. The timeliness of increasing the plate output of the country at this period is evident by reason of the tremendous orders for this material that are being placed by the government.

Ford Furnaces

Now Being Pushed Ahead Rapidly—Plans for Steel Works

Detroit, Oct. 16.—Building materials by the trainload are being deposited on the 134-acre site for the new blast furnaces of the Ford Motor Co., on the outskirts of Detroit. The first unit of this plant is expected to be in operation by 1920.

Although no official figures have been announced by Mr. Ford, it is understood that the entire project, including the blast furnaces, rubber tire plant and a plant for making motor car bodies, with their sites will represent an outlay of approximately $20,000,000.

Thousands of men are now at work building docks along the River Rouge and in the placing of foundations for the various buildings. It is expected the war department soon will undertake the widening and deepening of the River Rouge. This will permit the passage of 600-foot steamers transporting ore from mines in the upper peninsula of Michigan which have been purchased by Mr. Ford.

Julian Kennedy, the Pittsburgh engineer, has designed and is supervising the engineering work in connection with the blast furnaces. It is not the intention of the Ford officials to engage in the steel business for other than their own uses, which represent the requirements of the Ford Motor Co. and the Henry Ford & Son tractor plant, now engaged in turning out 8000 tractors for the British government.

Mr. Ford states that in the fiscal year ended July 31, last, the Ford Motor Co. turned out 785,824 automobiles, a gain of 251,903 over the previous year. Production this year has been on a basis of 900,000 cars annually. These 900,000 cars will require 400,000 tons of steel for frames, motors, axles, and the like, 6000 tons for magnetos, 8,000,000 square feet of galvanized sheet metal for gas tanks, 70,000,000 square feet of metal for fenders and 28,000,000 feet of tubular radius rods.

The Mt. Vernon Electric Light & Power Co., Mt. Vernon, Ind., has increased its capital from $5000 to $100,000.

Tin Plate Price

Expected Soon Now That Sheet Bars Have Been Determined

Pittsburgh, Oct. 16.—Announcement by the government of a price for tin plate is expected to be made soon. Now that the level for sheet bars has been fixed apparently it will not be difficult for the government to determine a price for tin plate. The fixing of a price for sheet bars, however, does not entirely clarify the situation, in view of other elements that enter into the matter. For instance, it has been pointed out that there is a shortage of approximately 40 per cent in the supply of sulphuric acid, as well as the need for increased imports of palm oil and tin. Makers will not open their books for 1918 business until after the government has set a level for tin plate and request has been made by the food administration that they withhold opening their books until Nov. 1. It is not known whether the food administration or the war industries board will name the price for tin plate.

Await Price

On Wire Products But Some Sales Made Up to $4.25

Pittsburgh, Oct. 16.—Announcement by the government of a price on nails is expected to be made soon in view of the fact that a level for wire rods has been placed. Independent makers continue to sell nails at $4 per keg, while the quotation of the American Steel & Wire Co. is $3.20, although the latter is not taking any new business. Government orders for wire and wire products continue to be placed and involve heavy tonnages.

Wire Sales at $4.25

Cleveland, Oct. 16.—Makers of wire products are expecting an early price announcement from the government in their line, now that wire rods have been fixed. In the meantime, independent producers continue to make some sales to the open trade at firmer prices. Some lots of wire were disposed of in the week at $4.25, Pittsburgh.

It has recently been announced that *La Societe le Fer*, the great iron association of France, has succeeded in producing electrolytic pure iron on a huge scale which it will employ in the commercial manufacture of iron pipe.

More Prices to be Announced Soon

Quotations on Various Finished Products and on Scrap Will Be Fixed Shortly—New Figures on Semifinished Materials Set Last Week Show Sharp Reductions From Open-Market Prices

WASHINGTON, Oct. 16.—Prices on various finished iron and steel products and on scrap will be announced within a few days. Following the announcement a few days ago of prices on semifinished materials, and several weeks earlier of prices on raw materials and bars, plates and shapes, the new prices will clear up much of the uncertainty under which the steel market has labored for weeks.

The new prices, which, it is understood, have been practically determined are for wire products, sheet steel, tubular goods, cold-rolled and cold-drawn steel and iron and steel scrap.

The prices which were announced late last week were for blooms, billets, slabs, sheet bars, wire rods, shell bars and skelp. As indicated by the accompanying box, the prices show a sharp cut from the quotations prevailing before the federal authorities took an active hand in fixing prices.

The new quotations were announced following a two-day conference between the war industries board and committees and members of the American Iron and Steel institute. The present schedule of extras and differentials will continue in force, although a few changes may be made by the trade itself through its representatives on the institute committees.

The President's announcement indicated that the cut in prices, although drastic, was about in line with the reductions made in pig iron quotations. The impression is generally held here that the President personally revised not only the new prices on semifinished materials but also on pig iron, plates, shapes and bars, when these price schedules were taken to him by Messrs. Scott, Baruch and Brookings of the war board.

The bases set on blooms, billets, slabs and sheet bars, are Pittsburgh and Youngstown. On wire rods, shell steel bars and skelp, a Pittsburgh base is set. The prices apply not only on purchases made by this government but by our allies and the general public. Distribution will be made through the war industries board's priority committee working in conjunction with the various committees of the institute. As in the case of the prices first fixed, the new schedules are subject to revision on Jan. 1.

The prices on those additional finished products, which have not yet been announced, are understood to be in the hands of the war industries board and will be turned over to the President at once. The board has received recommendations for these prices from the iron and steel manufacturers who took up this question immediately after an agreement had been reached on the quotations just announced.

The New Prices

SEMIFINISHED STEEL

Billets and blooms, 4 x 4-inch and larger, gross ton	$47.50
Billets under 4 x 4-inch, gross ton	51.00
Slabs, gross ton	50.00
Sheet bars, gross ton	51.00
Wire rods, gross ton	57.00
Skelp grooved, 100 pounds	2.90
Skelp universal, 100 pounds	3.15
Skelp sheared, 100 pounds	3.25

SHELL BARS

Over 5 to 8 inches, 100 pounds	3.50
Over 8 to 10 inches, 100 pounds	3.75
Over 10 inches	4.00

Prices for billets and blooms, slabs and sheet bars are Pittsburgh or Youngstown base; those for wire rods, skelp and shell bars are on a Pittsburgh base. The prices became effective instantly. They are subject to revision Jan. 1, 1918.

The conference was attended by many steel manufacturers, including the general committee of the institute of which E. H. Gary is chairman, and James A. Farrell, James A. Burden, E. A. S. Clarke, Alva C. Dinkey, Willis L. King, Charles M. Schwab and John A. Topping, are members. The chairmen of the special institute committees as well as many of the members also were in attendance. These committees are:

For Ascertaining Capacities and Supervising Allotments of Orders to Manufacturers—James A. Farrell, E. A. S. Clarke, J. A. Topping, E. H. Gary, ex-officio.

Alloys—J. A. Farrell, E. A. S. Clarke, A. A. Fowler, E. G. Grace, E. J. Lavino, E. H. Gary, ex-officio.

Iron Ore, Pig Iron and Transportation—H. G. Dalton, Frank B. Richards, Harry Coulby, C. D. Dyer, W. T. Shepard, G. H. Woodward, Leonard Peckitt, Frank Billings, Amasa S. Mather, secretary.

Sheet Steel—W. S. Horner, Charles O. Hadley, Walter C. Carroll.

Scrap Iron and Steel—Eli Joseph, Samuel Deutsch, Vernon Phillips, Joseph Michaels.

Pig Tin—John Hughes, E. R. Crawford, Edwin Groves.

Tin Plate—J. I. Andrews, E. R. Crawford, E. T. Weir.

Tubular Goods—James A. Campbell.

100 Per Cent Production Assured

In connection with the announcement of the additional prices the President gave out the following statement:

"The prices enumerated have been fixed by the President on the assurance of those representing the steel industry that these prices equitably adjust the relations of the steel interests to each other, and will assist them in fulfilling their obligations to give the country 100 per cent of production at not to exceed the prices heretofore announced.

"Measures will be taken by the war industries board for placing orders and supervising the output of the steel mills in such manner as to facilitate and expedite the requirements for war purposes of the government and those nations associated with us, and to supply the needs of the public according to their public importance and in the best interests of all, as far as practicable.

"A spirit of co-operation was manifested by the steel men and no doubt is entertained that every effort will be made to bring the production as nearly as possible up to the extraordinary demands resulting from the war."

Gary Calls Semifinished Prices Satisfactory

New York, Oct. 15.—Judge Elbert H. Gary, chairman of the United States Steel Corp., in reply to inquiry of the result of recent conference between the war industries board and the committee of steel representatives, today said:

"Our committee was in conference with the war industries board on Wednesday and Thursday of last week and agreed upon recommendations to the President concerning the prices to be fixed for many of the leading semifinished steel prod-

ucts and these were adopted by the President as published. On the whole, it may be said, the negotiations with the war industries board and the results were satisfactory to the steel producers although the prices named are lower than had been expected.

"The disposition of the members of the board to carefully inquire into the facts relating to costs, capacity, facilities and profits has been so fair and frank that the manufacturers, without exception, will be influenced to respond to the requests of the board for production equal to full capacity. And the prices determined upon will, with some adjustments between manufacturers as to deliveries, yield profits sufficient to bring them within the President's original proclamation.

"The prices of commodities not already considered by the board, will be fixed by arriving at a parity.

"The steel industry generally will be benefited by the attitude and action of the war industries board and the President. The profits of some of the manufacturers will be somewhat decreased. However, conditions will be more normal and they will be healthy."

Steelmakers Will Advise Government

Washington, Oct. 16.—The steel industry has arisen above the chaos created through the drastic penalties provided in Section 3 of the food control bill and is beginning to find itself on solid ground once more. From now on it will give the government such advice as probably never was contemplated when the United States went to war. This new situation does not belittle the sacrifice made by the industry in accepting the prices finally approved by the President in his statements of Sept. 24, and Oct. 11; in fact, the new position of the industry is a direct result of these sacrifices.

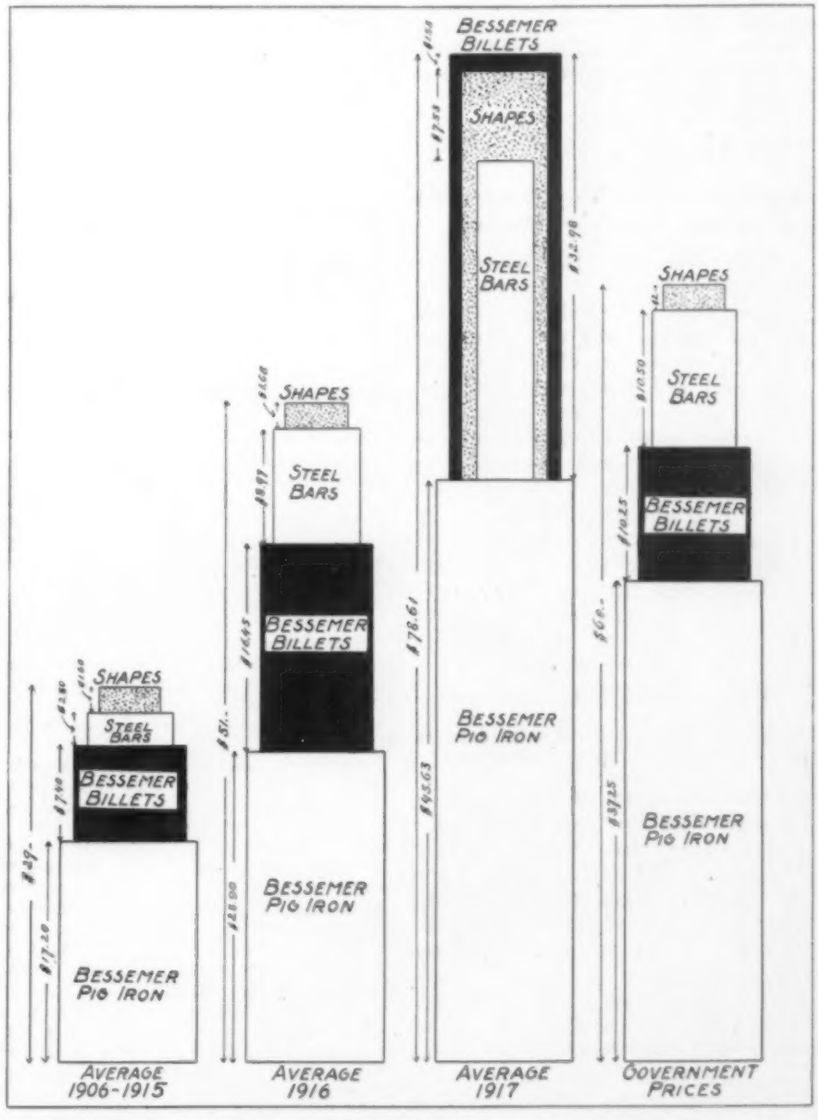
The American Iron and Steel institute, committees of which became part of the elaborate system of the council of national defense as formerly constituted, now again assumes the form of a purely trade organization acting for the industry, but at the same time is within close touch with the government. The council's admission that Section 3 made all industrial advisors practically liable to fine and imprisonment as long as they retained the mark of government officials, formerly divorced the advisory committees from government standing and put them back as representatives of their respective lines of business. Except for the services of a few $1-a-year men, this left the government high and dry.

Government Calls Steel Men

While Section 3 was still in doubt in the minds of the council, but was fully understood by the committee members, the government found itself badly in need of advice and did not hesitate to ask the steel and copper men to come to Washington and tell at just what prices they could continue to do business and supply not only the needs of the army, navy and shipping board, but also fulfill the war needs of our allies and the more essential commercial requirements of the American public. These conferences recognized the steel men as trade representatives and not as semiofficials.

To be at the government's finger tips, where action is swift, and to be close to the situation for future relations of the trade and the government, the institute has expanded its offices in the Wilkins building, Washington, with James B. Bonner in charge. Here the steel men who come to Washington will meet to confer on orders the government and the allies will place and to discuss general conditions affecting the trade.

While the priorities committee of the war industries board will be the official distributor of tonnage to the mills, the actual distribution will be made through the institute committee. J. Leonard Replogle, who is in charge of the priorities committees supervising distribution, and Mr. Bonner will be the two men through whom negotiations will pass. The priorities committee under the law really has the commanding grip, but the institute has the actual first-hand knowledge of the steel industry.



COMPARISON OF SPREAD BETWEEN PIG IRON, BILLET, BAR AND SHAPE PRICES FOR 1906-1915, 1916, 1917 AND AS FIXED BY GOVERNMENT

Huge Tonnage

Of Shell Steel Needed Surprises Makers—1918 Shortage Predicted

Pittsburgh, Oct. 17. (By wire.)—Demands being made by the government for shell steel for itself and its allies have reached huge proportions. Some surprise has been caused in the trade by the tonnage of this kind of material wanted by the allies. It was believed that their needs in this direction were being well taken care of by their own plants. This tonnage on which prices of 3.25c to 4c, Pittsburgh, have been fixed is to be manufactured by the allied nations into finished munitions by their own plants. The plate tonnage being placed by the government also is extremely heavy. The belief grows that there will be a marked shortage of steel next year. The production in 1918, according to well-informed manufacturers, will fall below that of the current year. This opinion is based on the scarcity of labor, lack of fuel supplies and to the increasingly unsatisfactory car movement.

Allot Ship Steel

Manufacturers and Navy Officers Will Discuss Destroyer Program

Washington, Oct. 17. (By wire.)—The first operation of the new relation between the steel industry and the government will come Saturday when representatives of mills making ship steel will meet with Rear Admiral Taylor, chief naval constructor, and other navy officers to discuss and allot plates and shapes to be used in building the 150 destroyers awarded by the navy department to five shipbuilding companies last week. The steel to be used in these destroyers will aggregate 75,000 tons. About a dozen steel men will attend the conference.

Ship Yards Merge

Bethlehem Companies Consolidate to Cope With Huge Orders.

New York, Oct. 16.—In order to expedite work on the present enormously augmented volume of ship contracts, the Bethlehem Steel Corp. has arranged to consolidate under one management all of its various shipyards, according to an official announcement just made. The proposed consolidation is expected through resulting standardization and centralization of management to increase production of the yards affected, a result of vital importance in this time of insistent demand for expedition in shipbuilding. For this purpose the Bethlehem Shipbuilding Corp., Ltd., with an authorized capital of $12,500,000, was organized in Delaware, all stock with exception of the qualifying shares of directors to be owned by Bethlehem Steel Corp. or subsidiaries. All contracts for ships hereafter taken by Bethlehem interests will be taken in the name of the new corporation. The companies to be consolidated are the Union Iron Works Co., Union Iron Works Drydock Co., and Harlan & Hollingsworth Corp., Samuel M. Moore & Sons Corp., Fall River Shipbuilding Corp., and the ship yard at Sparrows Point now operated by the Bethlehem Steel Co.

Taylor-Wharton Observes 175th Anniversary

High Bridge, N. J., on Oct. 13, was given over to a celebration of the 175th anniversary of the founding of the Taylor-Wharton Iron & Steel Co. The day's program, which was participated in by the company's 3000 employes and many of its customers and business friends, included an inspection of the plant; a historical pageant, a clam bake and other entertainment. Established in 1742 by Messrs. Allen & Turner, the plant at first was devoted to the manufacture of agricultural implements in use at that time. Shortly after its founding, Robert Taylor assumed its management and he has been succeeded in the intervening years by five generations of Taylors. The company has manufactured war munitions for the use of the United States armies in every American war. In 1891 the company began the manufacture of alloy steels, and its growth since that date has been rapid. In addition to its extensive plant at High Bridge, it controls the Philadelphia Roll & Machine Co., Philadelphia; the Manganese Steel Safe Co., Plainfield, N. J.; the Tioga Steel & Iron Co., Philadelphia, and William Wharton Jr. & Co., Easton, Pa. The latter company now occupies a large new plant at Easton which embraces three plants it formerly occupied in Philadelphia. The Tioga Steel & Iron Co. is erecting large additions to manufacture rough machined and heat-treated forgings for 4-inch guns for the navy.

The Non-Ferrous Metals

Copper Lead Spelter Tin

New York, Oct. 16.—Consumers are buying extremely sparingly of the various metals and activity in the metal markets remains at low ebb. The principal reason for this repression of activity is the continued uncertainty of the public as to the outcome of the present copper situation. Manufacturers working on government orders are assured of their supplies of metal at the government's price. But those who are doing work which has no direct connection with the war are not yet assured that they will obtain requisite copper supplies. Consequently they are also deferring their purchases of lead, spelter, tin and other metals which they may use in their operations.

The copper problem is apparently approaching a solution. A committee of the leading copper producing companies is meeting daily in an office at 60 Broadway, New York, to effect a plan by which copper may be distributed to the government, the allies and the public at the 23.50c price arranged with the government. The government supplies copper to manufacturers doing war work, buying the copper from this committee. Producers now are being allowed to make October shipments on old contracts made at the previous higher prices, to consumers who are in urgent need of the metal. Dealings in small lots of spot metal have dwindled to a point where they have become negligible. Spot electrolytic is offered by dealers at 26.50c to 27c. Spot casting is quoted 26c to 26.50c.

The American Smelting & Refining Co. last week reduced its lead price from 8c to 7c, New York, with the usual differentials for other points. This is the fourth reduction of 1c a pound since Aug. 29. Independent and outside sellers are meeting the leading interest's price, asking 7c, New York, and 6.92½c, St. Louis, for prompt and October shipment.

The spelter market has shown little change in weeks. Demand continues almost at a minimum, while prices have not changed perceptibly the past week. Prime western spelter is quoted 8c to 8.12½c for prompt and October shipment; 8.12½c to 8.25c for November and December shipment. Brass special grades range from 8.50c to 8.75c, St. Louis, for prompt shipment. High grade is quoted 13.50c, St. Louis.

Recent reports that the United States might commandeer Dutch shipping have aroused interest in the tin trade on the ground that such action would lead to the possibility of Holland placing an embargo on shipments of Banca tin from its possession of Java. The price of Banca tin has strengthened slightly, now being about 56.75c. Spot Straits tin is in rather light demand, being quoted nominally today about 61.37½c. Spot Chinese No. 1 tin is quoted 56.50c.

No activity is apparent in the antimony market. Small lots of spot Chinese and Japanese brands are offered at 14.75c to 15c, duty paid, New York.

The outside aluminum market is dull and weak. Quotations follow: No. 1 Virgin 39c to 40c; No. 1 remelted, 38c to 39c; No. 12 remelted, 33c to 34c.

France Fights for Lost Steel Power

Deprived of Richest Iron and Coal Lands and Largest Works She Struggles Heroically to Rebuild Herself—Many German Properties Sequestered —Historic Survey of the Rise of Nation's Industry

BY FRANCES MILTOUN

"IT GIVES to think," as the Frenchman himself puts it. I have just seen the most important regional sequence of French metallurgical industries grouped together anywhere in war time France. It recalls to my mind also some of the facts of the economic life of France with which I have come into contact in 15 years' residence abroad in a quasi-official capacity. I had been invited, along with eight other American correspondents in Paris, to become the guests of the chambers of commerce of the twin ports of Nantes and Saint Nazaire, and see for myself what extraordinary developments were being undertaken there at the end of this third year of the great war.

Primarily, the motive of this little expedition was to impress upon American interests the advantages possessed by these busy industrial and maritime cities at the mouth of the Loire on the midwest coast of France for an American base, if not for military or naval purposes, then for commercial needs.

Six deep-water ships flying the American flag lay in the port of Saint Nazaire when we arrived, three others were passed making their way upriver as we proceeded on the launch of the harbor boat down from Nantes. Five years ago a single craft so decked out would have—well, it would have done much towards explaining who and what we were. Today the flag is beginning to be known and we should be glad; it will indeed be better known before long. All these craft were loaded to capacity with products from the United States, of which iron and steel, machine tools, trucks and motors, copper from the Lake Superior district and tool steel formed practically their complete manifests. From 1913 to 1915 the increased metal products imports of Nantes alone amounted to 807 per cent. A million tons of metals and cereals were landed from the United States at the down-river port of Saint Nazaire in the last year, while during the first four months of 1917 steel products from the United States to the extent of a round 1000 tons a day have been discharged here. The big shipbuilding yards of the Chantiers de la Loire, Penhoët, where four dreadnoughts have been built in the past few years and whence also France's big liner FRANCE and her sister ship, the PARIS, not yet in service, were launched, the Steel Works of Trignac, the Acieries de Basse-Indre, the Fonderies de Couëron and a dozen smaller industries were all working the two rounds of the clock day and night, using up the raw material to make munitions and armament in such quantities as the comparatively minor big business of the France before the war would never have dreamed possible.

Thus inspired I am undertaking the compilation regarding the birth and growth of the French iron and steel industry. Until the most recent of times France's iron ore resources were largely drawn from the mines bordering on her eastern frontiers—exploitations to a large extent of puissant organizations which afterwards worked up this material into the finished product ranging all the way from coffee-mills to cannons. These mining exploitations of the east were located in three well defined basins, Briey, Longwy and Nancy. The first two still are in German occupation. The basin of Nancy delivered in 1913 a total of 1,914,921 tons of ore, grading 30 to 38 per cent. The Briey ore runs from 33 to 42 per

A HISTORIC VIEW OF THE FIRST FOUNDRIES OF THE CREUSOT WORKS

cent. There has been very little variation in the volume of the ore production of Nancy during the past decade. In the Longwy region four big properties came into German control and since have remained. These are Longwy, Acieries de Micheville, Forges du Nord et de l'Est. and the Forges de Denin-Anzin. All of these are in the heart of the most productive coal deposits of northern France. Another reason why they are so valuable as ore deposits is that they can be worked up largely on the spot.

The Briey region still is practically in German possession. For reasons political or otherwise according to the biting discussions of the Paris press during the past 30 months, it is likely to remain so until a deliberate French offensive towards its recovery actually takes place. It is a well known fact that previous to the war there were complicated French and German capital interests involved in many of the ore exploitations of Briey, which numbered in all about 70 individual concessions. It is possible that for this reason the rich mineral basin has been regarded since the occupation as a sort of no-man's land of the moment and that a claim for damages and unaccounted-for profits, will appear in the final bill of particulars which someday will be presented to Germany for settlement. The situation can not otherwise be adequately explained at this time.

Germany Coveted Rich Mines

The Hauts Fourneaux de Micheville are thought to be undamaged, as also the properties of the Aceries de la Marine at Joeuf and Homecourt, and those of Auberives and Villerupt. There seems little doubt that they all are being worked to the limit of their production on behalf of the Westphalian arms and ammunition manufacturers who doubly appreciate having such contiguous supplies of ore. This ore may be used in the making of cannon at Thionville, practically at the mine-side, at neighboring Metz or at Essen which is not far as the aeroplane flies. This reduces handling expenses to a minimum and saves much time. These are the chief economic advantages for Germany in the possession of these rich closeby deposits. It is so in this crisis of war; it was so before, for she had always covetously regarded them immediately they were proved to be of such great resource.

The great value of these deposits to Germany was preached for years by Professor von Kohlman of the School of Mines at Thionville, and with his appointment as mining commissioner of all the invaded region of Lorraine he has made it his business to see that his theory was sustained by Prussian military and industrial interests. Today, 30 months after he first stepped into the sinecure, German arms still are backing him up and maintaining brigades, battalions and divisions as a curtain barrier to shut off from the French all knowledge of what is actually going on save what dribbles through by "underground" methods, or is reported by the eyes of the air, the aeroplane observers.

The mining exploitations of Saint Pierremont and Mouriere are reported as still working, as are the coal mines of La Houve, to which, from some nearby generating plant, the German operators have brought electric power. The Acieries de Longwy owns the mines of Tucquegnieux and these are said to be in operation, as also Vallery, which though on French soil, was German-owned previous to the war. Farther north in the Department of the Pas de Calais the Isbergues plant of the Acieries de France has escaped entirely though on the very fringe of the invaded region, and has been operated with a skeleton force of labor so far as circumstances would permit since the opening of hostilities. Here, too, are the Pont a Vedin mines of the Commentry-Forchambault company and though a loss insofar as local production goes, the void has to a large extent been filled by the company's other exploitations contiguous to its steel mills in mid-France.

French Production of Iron and Steel

	Pig iron	Ingots
1906	3,314,000	2,451,377
1907	3,589,000	2,766,773
1908	3,401,000	2,723,617
1909	3,574,000	3,038,571
1910	4,038,000	3,413,000
1911	4,541,000	3,837,000
1912	4,939,314	4,428,219
1913	5,311,316	4,635,166
1914*	2,450,000	2,170,000
1915**	.....	.....
1916**	.....	.....

*Approximate for first half.
**No returns available.

Today's Production One-Third

In July, 1914, there were in operation in all France 45 steel works with 166 blast furnaces which turned out 425,000 tons of pig iron per month. At the beginning of 1917, in spite of the invasion of the northern and eastern departments, where the bulk of the industry had previously been centered, there were still 56 blast furnaces in operation when they could get the necessary coke. Actually French production is estimated at little more than one-quarter of what it was before the war but the figure is being increased from day to day. Other furnaces are being started as coke becomes available. Today there is going on a process of decentralization in all lines of French industry brought about by the deplacements of war. The steel plants in actual operation are scattered from Calais to Creusot, from Givors on the Rhone to Trignac on the Loire, and from Pauillac to the Pyrenees and the Ariege. It was all but fatal to France and to the industry that the makers should have been so largely grouped along the German frontier which for almost its whole length was invaded within 24 hours of the declaration of war and still is held by the enemy.

The largest individual output before the war was that of Chatillon-Commentry and Neuves-Maisons, amounting to more than 700,000 tons. Though French to the core curiously this was a German property which owned the gas works supplying light and fuel to the busy little industrial city of the latter name. The Nord and Est Co. produced 212,056 tons and Montataire 155,105 tons per annum. The remaining output was scattered over 13 other concessions.

Industrial Activity in the West

In the west there were 19 pre-war concessions for the extraction of ore in Normandy with probable resources of 77,000,000 tons and nine in Anjou further to the south with perhaps 20,000,000 tons available. Another 3,000,000 tons were in the Lower Loire district and Brittany. Still other deposits of minor possibilities in the center and the south of France, notably in the Pyrenees represent possibly ultimately 20,000,000 tons. This practically completes the known iron ore resources of France and is a figure far in excess of what was commonly supposed a generation ago. The Pyrenean region produced in 1913, the year before the war but 332,017 tons, an output which had been practically constant for a decade. This, however, is susceptible of great augmentation.

Of the Norman enemy-owned concessions, sequestered by the government from their alien owners at the beginning of the war, only the Saint Andre mine, producing 2500 tons of ore per month, was put into immediate operation. In this district, before the war, the Hauts Fourneaux de Caen were in part sustained and operated by German capital of the Thyssens, the Ruhr valley iron-masters, whose interests were of course, sequestered. Thus were allowed a reorganization and a continued operation of this newly-developed ore mining and steel manufacturing district which a generation ago was devoted to the raising of little cows and the marketing of fine cheeses and dairy products.

In the first year of the war more than 60 alien mining concessions came under sequestration, 32 steel furnaces and rolling mills, two wire mills, one nail factory, two steel barrel companies, 13 construction companies, three mining machinery companies, 93 machine shops, eight manufacturers of pumps, two of ball bearings, five of general hardware, one of cranes and 20 of boilers and heating appliances and two of saws.

Agriculture Joins With Founding

Previous to the revolution the foundry industry of France was an adjunct of local agriculture; even the vineyard owner often had his individual furnace from which he produced his small local needs of iron from ore which his laborers dug out on the spot. Under Louis XI foundry iron cost in the neighborhood of the equivalent of 100 francs per 100 kilos, dropping but slightly until Napoleon's time. The Massarge furnaces in the Department of the Allier in mid-France, in 1794, employed 500 laborers to produce what 50 would turn out today. In Roussilon, in the Pyrenees, a single furnace produced but 40 tons a year in the XVI century, while in the old French province of Alsace 100 tons in a twelfthmonth was considered a notable output for a local furnace in the XVII century.

Before the creation of the royal cannon factory at Le Havre by Louis XIII there was no establishment in France capable of producing armament. Richelieu, during the Thirty Year's war, bought his in England and Holland.

Under Louis-Philippe, pig iron cost the equal of $60 a ton at the furnace, and its carriage to Paris in those early days of rail transport cost another $10.

Until the beginning of the great war the chief bulk of the iron and steel industry of France was centered in the Departments of Meurthe et Moselle, Saone et Loire and the Pas de Calais and the Nord. Three other departments furnished but 11 per cent of the total output. The Department of Meurthe at Moselle, including the Briey, Longwy and Nancy basins, produced 66 per cent.

The most important establishment in the eastern frontier region before the war was that of the Hayange properties. These are mentioned specifically because of the wide-spreading branches of the family-tree, a twig of which was afterwards replanted and gave root to the Schneider branch at Creusot. It was due to the failure of one, Ponsard, a Frenchman, that the elder Schneider went to London to secure the rights of the Thomas basic process of steel manufacture, only to find that he had arrived too late and that the concession for the continent had been granted to a Belgian by the name of Tasquin by the notary's clerk who had invented it. The price was said to have been 1200 francs, or about $240. Schneider, however, secured the privilege of using the process in his works upon the payment of 25,000 francs, a bottle of champagne and an overcoat, as the story goes. Finally Messrs. Schneider and de Wendel of the Hayange properties bought in the equity in the process for 800,000 francs.

One of the principal units of the Hayange group is that of Joeuf in the Briey Basin, now in German possession but before the war but two steps from the frontier. Thsese ore deposits overlap onto German soil since the Treaty of Frankfort parcelled this part of Lorraine of the France of other days to the German Reichsland. It was in 1705 that de Wendel, a native of the region, then an appanage of France, acquired Hayange. For two centuries his descendants were the foremost iron masters of the district. One, Ignace de Wendel, a captain of artillery, contributed to the foundation in 1780, of the royal Creusot foundry, the almost immediate ancester of the Creusot works of today. Francois de Wendel, the son of the former, after the failure of his personal affairs was able, through the financial aid of influential friends to enter business and undertook for the Napoleonic government the fabrication of war material.

The Creusot Works has always differed greatly from that of the Wendels, catholicity and a variety in its output being its chief distinction. Creusot has become truly a national institution, though a private organization, producing practically all manner of steel products from construction material to armament and ammunition. Creusot owes its beginnings to a charter of 1507 which granted its most remote antecedant, one Pere Dubois, the privilege of extracting coal at Crosot for a period of six years. It was to coal, rather than to iron that the great works of today owe their inception. In 1784 a company was formed with Perrier and Bettinger at the head, to exploit the value of the mines at Crosot, Louis XVI being one of the stockholders.

Finally in 1836 Creusot became the property of Eugene and Adolphe Schneider. The first had been an ironmaster at Bazeilles in the Ardennes and brought a technical knowledge to the enterprise while the second was a novice. The latter died nine years later as a result of a fall from a horse. A dynasty of Schneiders succeeded. Henri, who succeeded his father at the latter's death in 1875, held the destinies for a time and in turn his son and grandson, Paul Schneider, who died only recently at the age of 75, was another son of the founder of Schneider et Cie of Creusot, an establishment referred to by the German Baedeker's Guide to France as "a machine shop." Schneider et Cie at its foundation had a capital of but 4,000,000 francs which absorbed, in 40 years 30,000,000 more. Today the censor prefers we do not discuss the financial status of any quasi-governmental sustained plant as is Creusot. Pre-war figures put the average laboring wage of the works at approximately the equivalent of $300 per annum, in addition to welfare benefits which exceed the sum of $32 per employe. This did not include the privileges of the children's free schools founded by one of the later Schneiders.

Outside of France, Creusot as a purveyor of war material has had a remarkable career. At almost any time a few years previous to the war, one might see in process in its chantiers and ateliers a monitor turret for Rumania, cannon for Japan and China, armor-plate for Chile, destroyers for Brazil and despatch boats for the Congo. The company's mines at Droitaumont, near the eastern frontier, have been wholly lost to it since the invasion but its other resources near at hand have kept the great plant at a high state of efficiency.

Employes Are Loyal

The war records of Schneider have yet to be written. It were preferable that it were left to the future time. Suffice to mention that the nationalism of the organization is one of its virtues. One-third of the workmen have given more than a quarter of a century of service under the tutelage of the Schneider dynasty; 10 per cent have been so employed for more than 40 years.

France's Imports Before and After War

	Pig iron	Semi-finished	Sheets	Tin plate	Rails
1913	50,345	19,379	18,944	19,460	1,792
1914	21,900	16,888	10,902	24,878	547
1915	175,301	566,853	80,462	68,340	40,658
1916*	288,762	612,597	133,928	53,625	31,811

*Six months.

Dividing Man Power to War Needs

How Great Britain Has Met the Problem of Distributing Its Human Forces Between Huge Army and Battle Front and Labor Supply in Munition Making and Essential Pursuits at Home

BY JOSEPH HORTON
Associate Editor, The Iron Trade Review, Birmingham, England

ONE of the formidable problems which the British government has had to solve during the war has been to maintain a steady flow of men into the army, and, at the same time, to secure requisite labor to produce munitions adequately, to take care of the ordinary commercial interests of the country and to keep food supplies up to national requirements. The problem now has been greatly simplified by the entrance of America into the war, though it is recognized that the American workshops all along have been a very valuable auxiliary, in supplying with war material Russia and other allies largely dependent upon outside sources for their munitions.

It cannot be said, even now, that the problem has been satisfactorily solved; recent provisions, however, have come nearer a satisfactory solution than anything previously attempted. Nobody denies that in the early days of the war the extreme urgency of army needs drew from the workshops many workmen whose services as skilled artisans would have been of much greater value to the country than they could be as soldiers. Many of these men have not yet been restored to the plants. This is due partly to the tenacity with which they are held by the military authorities, but chiefly to the practical difficulties attending the restoration of men scattered over different areas of the globe. In many instances, employers needing the services of the absent men have given up in despair the effort to get them back, though they now offer a sterner resistance to further efforts affecting those skilled workmen remaining in their works.

Badge of Exemption Used

In the early days of the war, a badge of exemption was furnished to workmen whose operations were considered to be essential to war production. It was much easier to get exemption in controlled establishments, and therefore the difficulty has become much less serious since the government declared practically every iron and steel works, foundry, gunmaking, and engineering establishment a government concern. It may be said with regard to the great bulk of the plants in the kingdom that they are under the direct authority of the minister of munitions. The latter can order them to do what work is considered necessary, determine on the priority of any order, and has absolute control over the labor available. But there are a large number of manufacturers making munitions of war who are not controlled, and at these places the men are compelled to remain, unless they can get a leaving certificate. The granting of this is entirely in the hands of the managers of the particular works. A man may leave such employment, but no other employer can take him on without the presentation of a leaving certificate, under a penalty of £50, a fine which on several occasions has been imposed.

What is called the one-sided operation of this certificate arrangement has been felt very keenly by the men, who complain that an employer can discharge a workman, while a workman cannot discharge his employer. This feeling has much to do with the prevalent dissatisfaction which has led to the setting up of an Industrial Unrest Commission now holding its sittings. It is understood that a new bill is to be introduced which will allow workmen to change their employment, on the understanding that any such change will be so carried out as to insure that they still will be engaged in war work.

With regard to the placing of the men in certain factories it was very early found necessary to protect the men against the over-zeal of the military authorities. To some extent there has been a little conflict of effort between the War Office and the Minister of Munitions and a war badge was furnished to the workmen in the form of

This Certificate must be signed by the holder in the space provided below and must be returned to the Society by which it was issued when it ceases to be in force.

Signature of Holder } _____

Place in which Registered under National Registration Act—

_____

Date _____

ORIGINAL.

TRADE CARD.

No. 201000

CERTIFICATE OF EXEMPTION
ISSUED BY THE
MILITARY AUTHORITIES

On ground that holder is marked in Military Register as not to be called up for service with the Colours so long as Certificate is in force.

_____

NOTE.—This Certificate is not granted under the Military Service Acts, 1916.

W10311—B651 500,000 11/16 HWV(P1152) G16,1750

TRADE CARD.

No. _____

Surname _____

Full Christian Name _____ Age _____

Address _____

Trade _____

Society _____ Branch _____

Name and Address of Employer } _____

_____

I hereby Certify that Mr. _____ was a skilled journeyman or apprentice on 15th August, 1915, and is a Member of the above Society, and,

* (*a*) is fully employed on War work,

* (*b*) has enrolled as a War Munition Volunteer.

* Strike out whichever is not applicable.

_____
Signature of District Secretary.

Address _____

_____

Date _____

EXEMPTION CARD ISSUED TO MEMBERS BY TRADE UNIONS—THE ILLUSTRATION AT THE RIGHT SHOWS THE REVERSE SIDE OF THE CARD

a small medallion which could be pinned to the breast. In addition, a certificate was furnished of which the following is a copy:

G. R.

This is to certify that..... employed by ..... is authorized to wear War Service Badge numbered ..... so long as he is employed on work for war purposes by the employer above named.

D. Lloyd George.

This badge and certificate were in use for a long time, but both have now been cancelled. The next step was the issue of what was called a trade exemption card supplied to certain craftunions, considered necessary for the production of war material. These were issued directly to the trade unions and then reissued by their officers to members who had been engaged in that class of work, prior to August, 1915. This in turn has been cancelled, and a new trade exemption card has been issued, as a sort of adjunct to a schedule setting out certain trades known as protected occupations. The advantage of this schedule is that it enables trades to be dispensed with or restricted in their occupation, from the point of view of their necessity for the time being, as producers of war material. The object of this was to weed out a large number of men possessing war badges and certificates, whose services could well be spared for the army, either because they were not regarded as highly skilled men, or because their industry was not of immediate urgency. The system has been found to work very much better, and has given a great impetus to the process of enlistment, without, as it seems, materially impairing the necessary output of war material.

The schedule of protected occupations now in operation was issued on April 21, and came into operation May 15. Its issuance was accompanied by an explanation that to supply the number of men required for the army a considerable number of men fit for general service, must be released. Accordingly, war service badge certificates and trade cards were superseded by a system protecting from recruiting, only men who might from time to time be found indispensable for the fulfillment of the varying programs of ship construction, munitions, and other essential government work. It was explained that the only ground for retaining a man of military age in one of the scheduled occupations was that he was engaged on admiralty, war office or munitions work, or in railway workshops. The national need did not permit of the retention on such work of any man of military age, who was not devoting his whole time and energies to it. The release of men was effected by means of age groups, commencing with the younger men. In connection with this scheme the enlistment complaints committee already set up to deal with the new trade exemption cards, was utilized, and the number of representatives of labor increased. The work of these particular committees is to deal with any complaints or grievances, or solve any doubts arising in connection with the status of a recruit or a workman, whose qualifications for army or workshop might be of doubtful value. A feature of the schedule was a statement of age at which men might be called up, and an interval generally consisting of weeks, which must be allowed prior to the operation of a calling-up notice. It is noteworthy that under this scheme all men engaged in shipbuilding, repairing and marine engineering are exempt. The same exemption applies to iron mining or quarrying, wolfram mining and metal manufacture; but only in a modified degree to the iron and steel manufacturing trades. The scheme has been very carefully considered with a view to retaining in their employment skilled workmen, while liberating their unskilled or semi-skilled helpers. Thus a skilled forgeman is exempt, but a forgeman's helper under the age of 20 may be called up. This has been carried out in a great deal of detail, not always, as may be imagined, to the satisfaction of the industries concerned. It will be readily understood that one of the objections to the trade card system under which the cards were furnished through the unions, was that it left out in the cold a great many thoroughly skilled workmen whose services were necessary to their trade, and caused in this way no little jealousy of the unions. The system was continued quite as long as it was possible. A recent development of the schedule has been the establishment of certain subcommittees, of the enlistment complaints committee in various areas, consisting of a member of the government with a military representative, trade unionists and trade officials, who deal with individual cases of hardship either from the individual or trade point of view. There is in addition a local advisory board as a department of the Ministry of Munitions, which deals with the complaints relating to methods of working. For example, if in any case working conditions are not observed, in accordance with the agreements, the matter is passed on to the board of the Ministry of Munitions, which in each district is in the hands of a specially qualified officer. One object of this appointment is to deal especially

MINISTRY OF MUNITIONS OF WAR.

To the Enlistment Complaints Sub-Committee, Munitions Area Recruiting Office.

KING EDWARD VII BUILDINGS, CORPORATION STREET, BIRMINGHAM

(Proper area is that in which Claimant is employed).

FOR OFFICIAL USE ONLY.
Area of Committee.....
Area of Sub-Committee.....
Number of Case.....

Form of claim to a Committee by a workman that he is in an occupation protected under the Schedule of Protected Occupations, and that he is consequently entitled to a Certificate of Protection from Military Service at the present time.

This Form is only for use by a workman who is NOT engaged on Admiralty, War Office or Munitions Work, or in a Railway Workshop, and who has enrolled as a War Munitions Volunteer.

1. (i.) Name of man in full..... (ii.) Check No.....
2. Present address.....
3. Occupation shown on National Registration Card.....
4. Registered address.....
5. Name and address of present employer.....
6. Trade Union and branch, if any.....
7. (a) Present occupation (state particular operations on which engaged. If turner or machinist state clearly type of machine).....
   (b) State nature of work on which now engaged.....
8. (a) At which Employment Exchange did the claimant enrol as a War Munitions Volunteer?.....
   (b) Quote the three W.M.V. enrolment numbers.....
9. If called up—(a) Address of Recruiting Officer concerned.....
   (b) Date of calling up notice..... (c) Date due to join the Colours.....
10. (a) Day and year of Birth..... (b) Whether married or single.....
    (c) Medical classification.....
11. Has an apprenticeship been served? If so, (a) at what trade?.....
    (b) For how long?..... (c) With what employer?.....
12. State particulars of experience, giving names of employers, length of service with each, and description of employment with each.....
13. State precisely under what occupation or occupations set out in the Schedule of Protected Occupations the workman claims to be included. (It is essential that this should be exactly stated, and code number of occupation in Schedule quoted).....
14. Date of commencing present occupation.....
15. Give full particulars of any further facts upon which the claim is based. (If necessary, this should be continued on a separate sheet and not on the back of this form.)

Date..... Signature of Claimant.....
(This must be signed by the workman himself.)
Address.....

Signature and Address of Officer of Trade Union if he puts forward claim } ..... Name of Union.....
Branch.....

Under the Defence of the Realm Regulations any person making a false representation on this Form of Claim renders himself liable to HEAVY PENALTIES.

L. E. C. 27 A.
(J 21679—Da.) Wt. 2797—G 3720. 500,000. 4/17 D & S.
(J 21711—„) „ —G 3880. 80,000. 4/17 „ [P.T.O.

FORM OF CLAIM FOR EXEMPTION UNDER SCHEDULE OF PROTECTED OCCUPATIONS

with section 7 of the munitions act which recognizes that any dilution of labor essentially is for the purposes of the war and must be carried out within strict limits. It is the business of the officer to see that this section is carried out.

Two other authorities known as Tribunals should be mentioned which are appointed in each district. They are, in fact, substantially two sections of the same tribunal. A typical one in Birmingham is presided over by a professor of the university. One section deals with infringements of the munitions act by employers, and the other by workmen. The latter has to do mainly with the question of leaving certificates, and the tribunal has authority to grant them if improperly withheld. The special feature of the employers' section is that a K. C. must be the chairman. In this case also he has with him an employer and a workman. But there is an important difference. Whereas in the workmen's Court the workman whose case is dealt with may employ a solicitor or the representative of the trade union may plead for him, in the other court employers must plead their own cause.

These Tribunals are directly appointed by government and, considering all the difficulties they may be said to have achieved a measure of success. The enormous increase in output of munitions would probably be considered by the enemy fairly practical evidence of the measure of success realized in the general organization and rehabilitation of the war industry.

This explanation would not be complete without some reference to the work of the national service organization, of which Neville Chamberlain is the chief. That organization commonly is described as having been more or less of a failure; but many competent authorities do not endorse this statement. It undoubtedly has been of great value in the collection of unskilled labor to replace men withdrawn from the farm. The entirely voluntary character of the system seems to account for the limited degree of success achieved. However, for the present, at all events, the national service organization is to be continued.

Large Increase in Limestone Production

The greatly increased activity in the iron and steel industries in 1916 caused a correspondingly large increase in the quantity of limestone marketed for furnace flux. The production was 23,603,508 long tons, valued at $13,936,882, an increase in quantity of 4,604,785 tons, or 24 per cent, and in value of $4,264,535, or 44 per cent, compared with 1915. The average price per ton, according to returns made to the United States geological survey, increased from 51 to 59 cents. Pennsylvania, the leading state, increased its quantity from 8,625,636 to 10,019,046 long tons and its value from $4,799,546 to $6,768,374. Ohio was second, increasing its quantity from 2,698,321 to 3,281,324 long tons and its value from $1,321,921 to $1,636,991. Michigan was third, increasing its quantity from 2,254,984 to 3,033,155 long tons and its value from $763,029 to $1,207,326.

A Systematic Reduction of Accidents

In these days of war when the conservation of manpower as well as that of all our national resources is given serious thought by all true lovers of America, the fact that 1,000,000 men are crippled annually in the industries of the United States is calculated to inspire even the most indifferent citizens to do what they can to obviate this shocking waste. According to the *General Electric Review*, which is publishing a series of articles describing "Life in a Large Manufacturing Plant," the wisdom of the adage, "An ounce of prevention is worth a pound of cure," is forcefully obvious in welfare work. While accidents cannot be eliminated entirely and emergency hospitals are therefore necessary, surprising results have been accomplished through a systematic study of causes.

An important element in the prevention of accidents is the instruction of employes, which amounts practically to education in safety habits. In determining the major causes of accidents, the safety committee of the General Electric Co., Schenectady, N. Y., issued blank forms on which particulars of all accidents, however slight, were reported by the various foremen. The study of the records was supplemented by a check on individual cases and showed that most of the accidents resulted from only a few causes. The statistics gathered reveals some very interesting facts, as follows:

The most careful age was found to be 37 years.

The ages showing the most accidents in proportion to the number of employes were between 22 and 26, and over 50 years.

The hour in which most accidents occurred was from 9 to 10 a. m.

More accidents occur on Monday than on any other day.

Contrary to the general belief, the foreign born employes are exceptionally quick in acquiring the safety habit—if taught.

Eighty per cent of the accidents are due to carelessness.

Fifty per cent of the accidents occur to new employes, that is, those who have been in the employ of the company less than six months.

More accidents occur in the hot season than in the cold.

With this information at hand, the officials of the company organized a central safety committee whose duty is to analyze the working conditions in the shops with respect to their effect on health and from the standpoint of hazards. This committee studies the causes of accidents, suggests means of preventing them and makes recommendations for the guidance of the local safety committee in each branch of the organization.

Educational campaigns also have been conducted, embodying noon-time lectures, instruction from foremen and the circulation of a safety magazine. Supplementing the educational activities, the company's engineers have designed and applied innumerable safety devices to the various machines. That such accessories have a widespread effect in reducing the number of injuries is noted from the fact that less than 10 per cent of the accidents in the Schenectady works last year were classed as "machine accidents." Forty-seven per cent were due to handling materials.

Makes Forged Twist Drill

Forged twist drills now are being made by the A. E. Russ Forged Drill Co., Cleveland, by a process said to be unique in the art of drillmaking. Essentially this process incorporates two forging operations; a round piece of high-speed steel first is forged down to the required size, and in a second forging operation the flutes are formed. In this process, the treatment is said to be such as to insure a drill in which the grain follows the spiral, instead of running straight from end to end. For this reason, the claim is made that the drill made by this process is exceptionally strong. During cutting, the cutting edges are said to be especially free from danger of breakage and easily adaptable to high cutting speeds.

Mill Transformers

A unique feature of several large, self-cooled transformers built by the General Electric Co., Schenectady, N. Y., for the Carnegie Steel Co., is the construction of 24 radiators external to the containing tank which give a radiating surface of 6940 square feet. Cooling is obtained by circulating oil through the radiators. These transformers, which were designed for mill service, are single-phase, 8000 kilo-volt-amperes each and step the voltage from 44,000 to 6600 volts.

Machining Malleable Iron Castings

A Discussion of the Types of Malleable Iron That Cause Difficulty in the Machine Shop and Suggestions for Remedies That Will Preclude Their Appearance

BY A. T. JEFFERY

THE advent of the automobile with the subsequent use of large quantities of malleable castings in its construction opened up a new line of troubles for the malleable manufacturer, with all of the old troubles seriously magnified. High-speed machinery puts malleable iron to a very severe test and the very best quality is not any too good for this purpose. Any product containing iron-carbide will be found unsatisfactory under these conditions.

White iron with its large percentage of iron-carbide will destroy the most costly tools just as quickly as it will the cheaper grades. In many cases it causes a delay of several hours, holding up the production of an expensive machine. Similar results, although perhaps to a lesser degree, will result from machining any iron containing even a small percentage of combined carbon. Iron with a pearlitic rim will spring machine tools causing them to give oversize dimensions, making necessary a second operation. Iron with a thick decarbonized rim will clog the teeth of milling cutters and push ahead of a lathe tool that is properly ground for machining ordinary malleable.

Five Varieties Cause Trouble

There are five distinct varieties of iron from which one or more of these complaints may arise. They include pure, hard white iron, under-annealed iron, iron cooled too quickly, burned iron and iron that is sometimes called hard but is really tough and stringy.

Pure, hard white iron cannot get into the machine shop except through carelessness. It is very easily recognized by an expert, although to the uninitiated and under ordinary conditions it may be confused with under-annealed iron. The only remedy for pure white iron in the machine shop is care that hard and soft iron shall not be allowed to come in contact with each other or cross each other's path in passing from one department to another.

Under-annealed iron may be in two states, first as shown in Fig. 1, not affected by the heat of the annealing furnace. In this condition it has practically the same qualities as pure white iron except that initial strains due to cooling from the molten state have been removed. The second state is shown by Fig. 2. This iron will give all kinds of trouble in the machine shop. It will wear machine tools very rapidly, cause them to heat and will also strain the jigs and clinches unless they are massive and designed with a large factor of safety. It will show a black fracture when broken and cannot be detected except by chemical or preferably by microscopic analysis. It has little ductility and only slight resistance to shock.

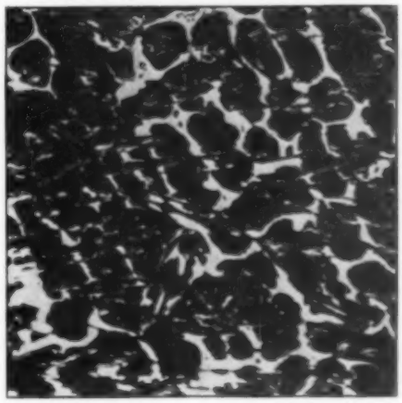


FIG. 1—MICROGRAPH OF WHITE IRON SHOWING FREE CEMENTITE IN WHITE AREA—DARK AREA IS PEARLITE

Either state of under annealed iron is caused by lack of proper heat treatment. Annealing ovens with bad circulation, too large annealing pots or lack of proper knowledge or facilities for reading temperatures are the usual underlying causes. They are to be remedied by a scientific study of draft conditions, size and spacing of pots and the installation of adequate and reliable pyrometers. Large pots jammed tightly together forming nearly a solid mass of iron can heat only by the conduction of heat from the exposed tops, which must be at a considerably higher temperature than is necessary to anneal properly, in order to produce a flow of heat to the less exposed parts. There is thus a tendency toward false pyrometer readings of the actual temperature of the coldest part of the oven, the inside of the pot. There will be very little circulation of hot gases around the pots and they will go to the outlet that offers the least resistance and is the most direct. The outlets for gases should be so placed that the gases will be forced to come in contact with all parts of the oven and the intensity of the draft should be measured and gaged to insure a proper quantity of heat reaching every pot.

Test Lugs Are Useful

As a check on the efficiency of the heat treatment, test lugs should be placed on all castings. They should be broken by hammering and the quality of the iron determined. In the case of small castings at least one should be broken from the center of the bottom of each pot. There will be no trouble from under annealed iron in the machine shop if these suggestions and precautions are carefully heeded.

One of the most aggravating troubles for the machinist is caused from iron with a pearlitic rim, as shown in Fig. 3. It will lead the machinist to register a vigorous kick and yet under ordinary tests the cause cannot be detected and the average observer will pronounce the iron good. The iron very likely will bend well when hammered and the fracture will be black except for the usual compression edge seen in all black heart malleable. Such iron, however, will wear and spring the machinist's tools and his verdict will be "hard iron." When subjected to the microscopic test, however, by a trained observer the trouble is easily determined; usually it is caused by too quick cooling. This has not caused it to be entirely returned to the white iron state and will not unless the cooling is done very quickly.

Quick cooling is nearly always the result of carelessness or lack of knowledge of the consequences. Iron cooled faster than 20 degrees per hour will be in the danger zone. Bad dampers controlling the draft, fire and ash pit doors left open, cracked or leaky walls and removing the doors from the oven too soon will cause this trouble. A crack in the ash pit wall where the fire is above the floor line of the oven will furnish enough cold air to chill adjacent pots. The remedy is obvious. First, however, an educational program must be instituted, because workmen in charge of the annealing generally do not understand the detrimental features resulting from little acts of carelessness in looking after this

A paper read at the Boston meeting of the American Foundrymen's Association. The author, A. T. Jeffery, is assistant superintendent, Dayton Malleable Iron Co., Dayton, O.

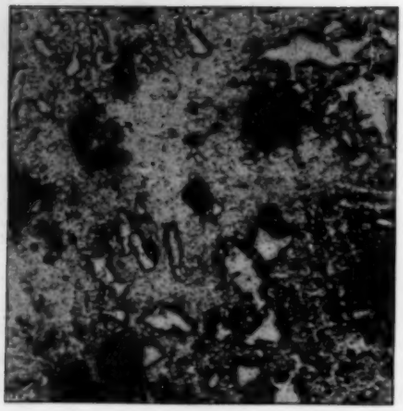


FIG. 2—UNDER-ANNEALED IRON SHOWING SOME FREE CEMENTITE

part of their work. They are in the habit of judging from fracture and therefore do not detect anything serious when a piece of iron cooled too quickly is broken.

Burned iron affects the machinist in about the same manner as hard or unannealed iron. It is perhaps a little more easily drilled and with very powerful tools may be machined. However, what has been said about hard iron will fit here also. Fortunately for the malleable manufacturer, burned iron is rare except as it creeps in at the tail end of a cast unobserved to be discovered later and laid at the door of the annealing oven when its identity is not fully ferreted out and properly accounted for. I am considering here as burned, that iron in which certain elements have been too far removed to allow the breaking up of the iron carbide in the annealing furnaces. Except in very rare cases it is not seriously damaged as far as its properties are concerned, although in those rare cases it will take on a honeycombed appearance and become absolutely useless except for remelting.

If either the carbon or silicon is too much reduced in the melting furnace, iron will be produced that cannot be annealed, under ordinary conditions. Iron too low in silicon can be obtained by error in calculating the mixture, mistake in the chemical laboratory analyzing the pig iron or by excessive oxidation in the melting furnace. Manufacturers using a low-silicon, high-carbon mixture are most liable to encounter this condition. Error in the calculation of the mixture needs no comment; it is the result of carelessness or may be due to entrusting this work to an incompetent man.

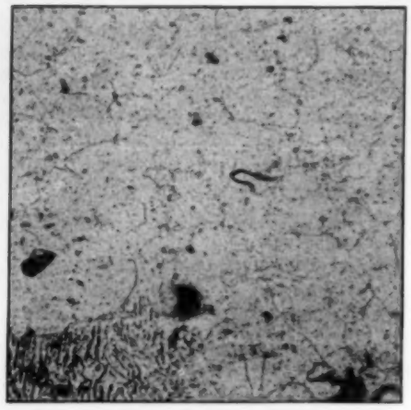


FIG. 4—DECARBONIZED RIM

Bad chemical analyses may often be laid at the door of the blast furnace people, some of whom have had the honesty to admit that their analyses may be as much as 20 per cent off either way. The best way to eliminate this evil is to analyze each car of iron and use more than one car or kind of pig iron in the mixture, trusting in the law of averages to keep within proper limits.

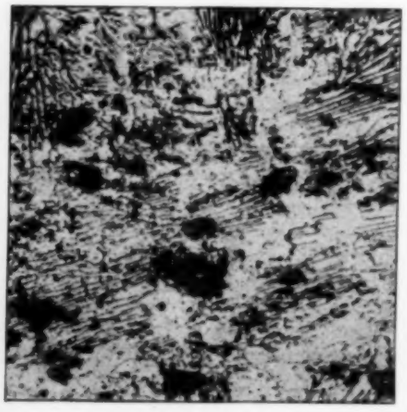


FIG. 5—FRAME OF PEARLITE

A furnace that is oxidizing rapidly will finish the job if the conditions mentioned are not watched; a sleepy fireman with holes in his fire or too much blast coupled with bad furnace practice will increase the danger. A well practiced eye aided with long experience in taking tests under standard conditions will help materially when low silicon is encountered because the eye will detect the trouble and our old friend ferrosilicon may be added to bring up the silicon content.

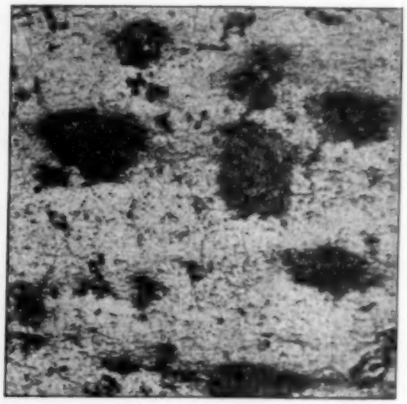


FIG. 6—CORE INSIDE OF FRAME

Carbon plays just as important a part as silicon and may or may not be low enough to give trouble when the silcon is low. When one considers that the best malleable is made with carbon hovering near 2.30 per cent and that 2.20 per cent is decidedly in the danger zone with ordinary malleable mixtures, also that pig may vary as much as 1 per cent in carbon, then one must prepare for trouble if he attempts to make low-carbon iron in large quantities with several furnaces running. Carbon is subject to about the same amount of oxidation as silicon under the same conditions, the only difference being that it cannot be replaced as readily. Therefore it behooves the most of us to play safe on carbon, at the same time protecting the machine shop from hard iron and also from semi-gray iron.

Last but not least of the sources of complaint from the machine shop is iron that bears the name of being hard but really is too soft and tough to machine readily. Most machine hands have had

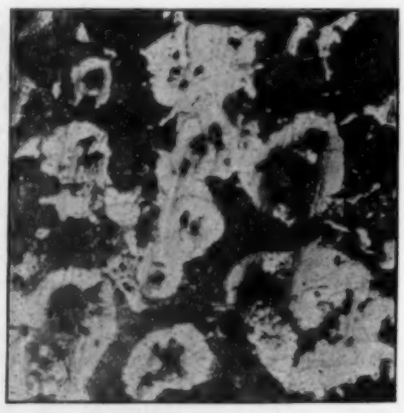


FIG. 3—IRON COOLED TOO QUICKLY, SHOWING PEARLITE IN DARK AREAS

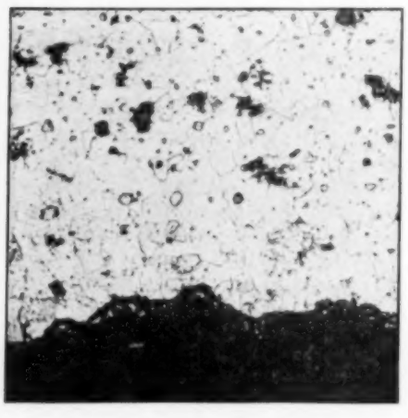


FIG. 7—DECARBONIZED RIM OF TOUGH MALLEABLE IRON SHOWING CARBON

trouble at one time or another machining very good wrought iron. It pushes ahead of the tool and causes excessive chattering and wear, making necessary an extra cut, and in case the machine tool is weak it will jump out of the holding fixture and seriously strain the machine. The outside rim of extra-good malleable resembles the best wrought iron and closely rivals it all through the section. Its chemical make-up as far as iron is concerned is the same except that the particles of slag worked-in in wrought iron are replaced with particles of temper-carbon in malleable iron as shown in Fig. 7.

Manufacturers of malleable iron should refuse to take this kind of iron back as foundry scrap. They should demand that the user provide sufficiently strong machine tools, run at such speeds as to readily care for this iron. The writer had occasion recently to inspect castings returned for being hard that had been drilled in several places and tapped in others without any apparent difficulty but upon boring a 12-inch dimension, the tool had evidently refused to cut, microscopic analysis showed good normal malleable but upon investigation it was determined that the machining was done on an ordinary drill-press using a boring bar in place of a drill running at high speed. The best high-speed steel was used. On the other hand, a certain well-known manufacturer uses such sturdy machines that a chattering tool is rarely heard in the entire shop and when a casting is returned for being hard there is no doubt about the fact that it is hard. Of course, these are two extreme cases, but they serve to illustrate my point.

The malleable manufacturer can eliminate all trouble from this source by making relatively high-carbon iron, annealing it in nearly inert packing, producing iron that perhaps will pass as malleable. But at the same time he will be wandering away from the best practice and will not add to the reputation of the industry, which has suffered in the past from just such weak-hearted practice.

In summarizing, it may be said that the fundamental or underlying cause of trouble with malleable iron in the machine shop is generally due to a lack of scientific study of the material in question along practical lines and to the lack of active co-operation by the users of malleable iron. Designing engineers have neglected to familarize themselves with the properties and peculiarities of malleable iron due largely to the meager amount of authoritative information in print, and their unwillingness to accept the statements of men who are well informed but are perhaps unable to express themselves fluently and who are the operative heads of our best malleable foundries. In many instances bad designs are changed with reluctance, although the engineer is becoming more alive every day to the advantage and necessity of close co-operation with the practical man in the foundry. As in other spheres, therefore, *co-operation* should be our watchword and with intelligent effort and hearty co-operation between producer and user, most of our troubles will disappear.

Emphasize War Problems

Munitions and Aircraft Sessions to Assume Important Roles in Annual Meeting of American Society of Mechanical Engineers

MANY engineers realize that the time is past when they can continue to convene as a unit and devote their attention to the commonplace details of engineering practice. With this in mind, the American Society of Mechanical Engineers has planned a program for the annual meeting, Dec. 4-7, designed to be of definite and constructive value for those in the service of the nation. While a sufficient number of technical papers will be provided on general subjects, emphasis will be placed on a series of addresses to be given on some of the broad problems that now confront the engineer in his endeavor to give his country the mastery in the great struggle which is to make the "world safe for democracy."

On Tuesday evening William H. Taft, former president of the United States, will address the society after which honorary membership will be conferred on Maj. Gen. George W. Goethals. The business meeting on Wednesday morning will be followed by a session in charge of the committee on local sections. An intimate account of the engineering achievements of the late E. D. Leavitt will be presented by F. W. Dean.

All are agreed that to win the war there must be conservation of resources, including food, fuel and supplies of all kinds; higher efficiency in industry and transportation; unlimited production of munitions and appliances of war; willing co-operation on the part of every citizen, regardless of his status in life; and the greatest possible development of American inventive and productive talent.

The question of the solution of such problems as the foregoing will form the basis of the keynote session on the general subject of service of the engineer to the public. This session will last all day Thursday, Dec. 6, and will be opened by President Hollis, who will speak on "Universal Public Service in Peace and War." He will be followed by other speakers treating on the following topics: Railroad transportation, motor transportation, the aircraft problem, topical discussion on aviation, special education in time of war, engineering research, and building a merchant marine in minimum time. In the case of the aircraft problem there will be discussed the selection and training of aviators, and problems of aircraft engineering and aircraft production.

At the spring meeting of the society held in Cincinnati, the three sessions on the principles involved in the manufacture of munitions were among the most enthusiastic and largely attended meetings ever held by the society, members attending from all sections of this country and Canada. In order to carry this work still further a session has been arranged for the annual meeting by the sub-committee on machine shop practice, upon the subject of inspection. An attempt will be made to present both the requirements of the government and the difficulties encountered by manufacturers in interchangeable manufacture, with the object of defining as far as possible the philosophy of inspection, and offering constructive suggestions for carrying out its underlying principles.

Another timely subject under the present condition of affairs where manufacturers are working under tremendous pressure is that of industrial management and methods of increasing production. There will be a session on management at which one topic, a comparatively new one, will relate to the employment of women in the skilled industries, with special reference to machine-shop and heavy work. Bearing on this subject will be addresses on the relation of industrial management to the engineer, to indicate the broadening field of the engineer and the extent to which his efforts must lie in the direction of the management of men, both in respect to efficiency and to social service.

It is expected further that Dr. Brashear will deliver the lecture on "The Beautiful in Commonplace Things," which he was to have given last year, but was prevented from doing by his trip to the orient. This lecture will be as an oasis in a desert in these war times when we are prone to forget that there are larger, higher and more important things in life than strife among nations.

Electric Pig Iron in War Times

The Prevailing High Prices of Pig Iron Suggest the Possibility of Commercial Electric Pig Iron—Low Phosphorus Scrap is Being Turned Into Shell Steel By This Process

BY ROBERT TURNBULL

THE abnormal high prices which are at present being paid for iron and steel products, and which have been ruling for the last 18 months, have seemingly failed to stimulate or encourage the manufacture of pig iron from ore in the electric furnace. Comparatively little progress has been made in the United States or Canada in this field, and it may safely be said that outside of Sweden and Norway the production of pig iron from ore in the electric furnace is practically nil. That pig iron could be made from ore in the electric furnace under present conditions, and at the same time yield a handsome profit, there is not the slightest doubt, but there are many difficulties in the way of the prospective manufacturer. One of the most serious of these is the shortage of power.

Energy Requirements

In the early part of 1906, when the smelting of pig iron in the electric furnace was undertaken by the Canadian government, the report issued some time afterwards claimed that the results of the experiments had proved that four tons of pig iron could be produced per horsepower year, in other words, this amount of iron could be produced with an expenditure of about 1650 kilowatt hours, whereas the present Swedish practice, where large furnaces are used, shows that from 2500 to 3000 kilowatt hours are required to produce one gross ton of gray iron.

A few years ago the writer made some experiments with a single-phase furnace using about 650 kilowatts, the ore used being a hematite containing from 50 to 52 per cent metallic iron. This furnace was operated for several weeks and the expenditure of energy per gross ton of pig iron produced was 2300 to 2400 kilowatt hours. It will therefore readily be seen that to produce any considerable quantity of iron in the electric furnace, large amounts of power will be necessary, and this, coupled with the fact that such an enterprise only could be operated under existing conditions, which are liable to change at any moment, has no doubt deterred investors from risking the capital necessary for such an undertaking.

The writer's own experience has not gone to show that any advantage has been gained either by lowering the expenditure of power or decreasing the gross cost of the product by the use of the shaft furnace, such as is used in Sweden, for unless the gases are utilized the shaft furnace becomes a complicated, expensive and unnecessary piece of apparatus. A well-designed ordinary electric smelting furnace with partial roof and automatic charging from overhead hoppers, will produce a cheaper pig than the shaft furnace, and the first cost of plant would be considerably less.

Analyses of Electric Pig Iron

Heat No.	Silicon	Sulphur	Phosphorus
237	1.45	0.025	0.025
238	1.83	0.029	0.031
239	2.82	0.030	0.033
240	2.11	0.029	0.027
241	1.88	0.025	0.027
242	2.49	0.027	0.027
243	1.21	0.035	0.040
244	2.35	0.030	0.030
245	1.25	0.029	0.031
246	1.55	0.027	0.027
247	1.59	0.028	0.031
248	1.50	0.025	0.029
249	2.02	0.029	0.032
250	1.50	0.032	0.038
251	1.41	0.029	0.033
252	1.50	0.025	0.023
253	2.20	0.025	0.027
254	1.50	0.027	0.030

With the war, however, a new field has been created for the electric furnace, which owing to its low initial cost and low power consumption, bids fair to become very popular, and that is the production of pig iron from shell turnings and shell scrap.

As the specifications for steel to be used in the manufacture of shells call for low phosphorus and sulphur, it is possible in the electric furnace to produce a low phosphorus pig iron from such scrap at a figure which, given the present selling price of low phosphorus pig iron, yields a handsome profit, while very little refining is necessary. Any type of steel furnace can be used for this process, and it is not even necessary to have a furnace of the tilting type when little refining has to be done, as by special manipulation of the slag in the furnace, a certain amount of phosphorus can be removed, and sulphur is always to some extent eliminated by the basic slag employed.

The possibility of this process was first brought to the writer's attention in the fall of 1916, and experiments were immediately undertaken in a small furnace at Orillia, Ont. These experiments having proved the process to be a feasible one, a new single-phase furnace was built and has been in successful operation since January of the present year. From six to seven tons of low phosphorus pig iron were being produced per 24 hours, the amount of power used on the furnace being about 250 kilowatts.

Furnaces for this work have since been installed at St. Catherines and Collingwood, Ont., also at Shawinigan Falls, Que., and a number of furnaces are now operating in the United States.

Description of Furnace

At St. Catharines, the furnace is of 6-ton capacity, 3-phase, operated by 1200-kilowatt transformers. Only 700 kilowatts are being used at the present time, owing to the shortage of power. The daily output is around 20 tons. It is estimated that the production will attain 35 gross tons with the full power of 1200 kilowatts. The operation is in many respects similar to the making of steel in the electric furnace, the refining process for the elimination of phosphorus being somewhat different. The charge consists of shell turnings, the necessary carbon base, which may be charcoal, coke or coal, ferrosilicon and lime. Manganese is not added, as care is taken in the process to conserve the manganese already contained in the turnings. The furnace is of the fixed type, with a carbon bottom and silica brick lining; there are two charging doors and one tap hole. The furnace is controlled by automatic regulators which eliminate to a great extent manual labor, giving a much steadier load than is possible to obtain by hand control. The product is cast in sand, the pig beds being placed about 30 feet from the furnace. In the Orillia plant the iron is cast into iron molds. The return in iron as compared with the scrap charged is about 95 per cent, and as about 5 per cent is added to the iron in the form of carbon and silicon, the total loss is about 10 per

A paper presented at the thirty-second general meeting of the American Electrochemical society, Pittsburgh, Oct. 3 to 6, 1917. The author, Robert Turnbull, is electric furnace engineer, Welland, Ont., Canada.

cent of scrap charged. The pig produced is very tough and the analysis is fairly uniform as can be judged by the accompanying table of consecutive heats.

The carbon is very rarely over 3 per cent; above this point any extra carbon added is very destructive to the lining and roof of the furnace. A roof will last from 150 to 200 heats; the roof conditions are being gradually improved and 300 heats may yet be realized for one roof.

The process is not a new one, as attempts were made several years ago to make pig iron from scrap steel, but the cost was found to be prohibitive. The writer also made some experiments in operating the pig iron furnace with ore, by mixing 50 per cent each of scrap and ore in the charge. The result was an increased production from about six tons on ore alone to 11 tons with the mixture. The same amount of power was used in both cases.

Whether this process will be feasible after the war when normal conditions again prevail is not a settled point. The cost of production is at present high, and would be prohibitive under normal conditions. It must be remembered, however, that costs today are possibly 50 per cent higher than they were three years ago, and it is the writer's conviction that provided future experiments find a means of eliminating phosphorus from the iron without removing the slag, the process can be profitably operated in normal times, at least in Canada, where low phosphorus pig iron is always a dollar or two higher than the prevailing prices in the United States.

In conclusion, although a little foreign to this paper, the writer would like to call the attention of all those interested in steel furnaces to the roof coolers, which are placed around the electrodes in order to keep the bricks at that point as cool as possible. Recent practice at St. Catharines has shown that the life of the roof can be prolonged materially by correct application of these roof coolers, especially the ring of bricks around the electrodes. These coolers should be made to the exact form of the roof, and should rest on the bricks which form the ring around the electrode, and not on any packing between these bricks and the cooler. They should not be flanged, but cast to a special form, so that the cooling water will be at an equal distance from all outside surfaces.

Installs Powdered Coal Equipment

DURING the past two or three years manufacturers located near the gas fields of Western Pennsylvania and Eastern Ohio, have become alarmed over the impending natural gas shortage. Among the first manufacturing concerns to realize the seriousness of the situation was the Standard Tin Plate Co., Canonsburg, Pa. A complete powdered coal equipment was installed and now supplies the 18 annealing furnaces, 50 tin pots and 46 sheet and pair furnaces. The equipment was installed by the Bonnot Co., Canton, O.

The operation of the pulverizing plant is as follows: Three 9-inch screw type conveyors, which run in concrete trenches, receive the lump coal from the storage bins and deliver it onto an 18-inch belt conveyor, which runs at righ angles to the screw shafts. The coal passes from the belt conveyor to an 18-inch magnetic separator which extracts the foreign matter. The coal is discharged onto a bucket elevator, 31 feet high and driven by a 5-horsepower motor with a speed of 1140 revolutions per minute. The buckets empty into a spout leading to a scale hopper, which automatically weighs and discharges the stocks into a dryer of the rotary kiln type, driven by a 7½-horsepower motor turning 840 revolutions per minute. The motor was built by the Crocker-Wheeler Co., Ampere, N. J. The kiln is hand-fired and reduces the moisture content of the coal to about one-half of 1 per cent. Dust-tight rings are provided at both ends.

A 9-inch screw conveyor driven by a 3-horsepower motor transfers the coal from the drier and distributes it into two 1-ton storage bins. Each bin feeds into two pulverizers which are individually driven by a 30-horsepower motor and at 1150 revolutions per minute. These pulverizers have a crushing capacity of 2500 pounds of coal per hour to a fineness of 95 per

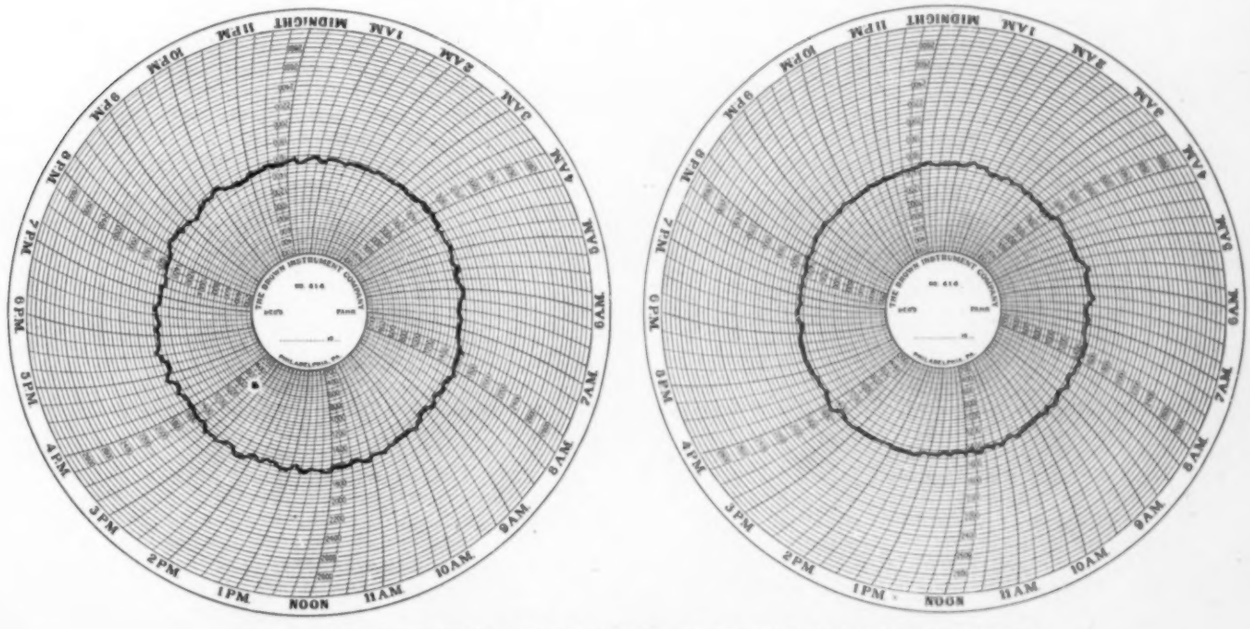


FIG. 1—CHARTS SHOWING TEMPERATURES IN HEATING AND PAIR FURNACES

cent through a 100-mesh screen and 85 per cent through a 200-mesh screen.

After the coal is ground it is elevated into a dust collector by means of an exhaust fan driven by a 7½-horsepower motor. The air is drawn back into the pulverizer. Thus, a partial vacuum, a permanent fineness and a nonleaking receptacle are maintained.

The dust collectors feed by gravity into a 25-ton storage bin. A 6-inch screw conveyor transfers the dust from this bin to a cast iron, high pressure distributing blower, 62 x 12½ inches. This blower is operated at 1800 revolution per minute by a 25-horsepower motor and is equipped with an air-regulating device which permits the coal dust to be carried by suspension to the various heating furnaces at a velocity of approximately 88 feet per second.

The amount of powdered coal fed to the blower is controlled by a regulator governing a 2½-horsepower motor which varies in speed from 550 to 2200 revolutions per minute and drives the screw conveyor accordingly. The amount of air fed into the blower is regulated by the float system. When the operator opens a branch line supplying coal to the furnace, the regulator and float automatically increase the volume of coal and air in the distributing lines.

The ratio of coal dust and air in the distributing pipe is such that the mixture is noncombustible. The additional amount of air required for complete combustion of coal is supplied under pressure at the furnace burner, This is clearly illustrated in Fig. 2.

The charts, Fig. 1, show that by burning powdered coal, temperatures of 1400 and 1600 degrees Fahr., are maintained in the pair and sheet furnaces, respectively. This requires 280 pounds of fuel per ton of steel heated or a saving of 60 per cent compared with 600 pounds of coal per ton of steel, heretofore hand-fired. It was found that in the 18 annealing furnaces, 75 pounds of powdered coal were equivalent to 1000 cubic feet of natural gas and in the 50 tin pots, 26 pounds of powdered fuel were equivalent to 350 cubic feet of natural gas.

The Standard company is said to be the first tin plate concern in the world to employ powdered coal in all heating units throughout its works. The officers of the company are Louis Follett, president; E. K. Norton, vice president; and W. J. Lynch, general manager.

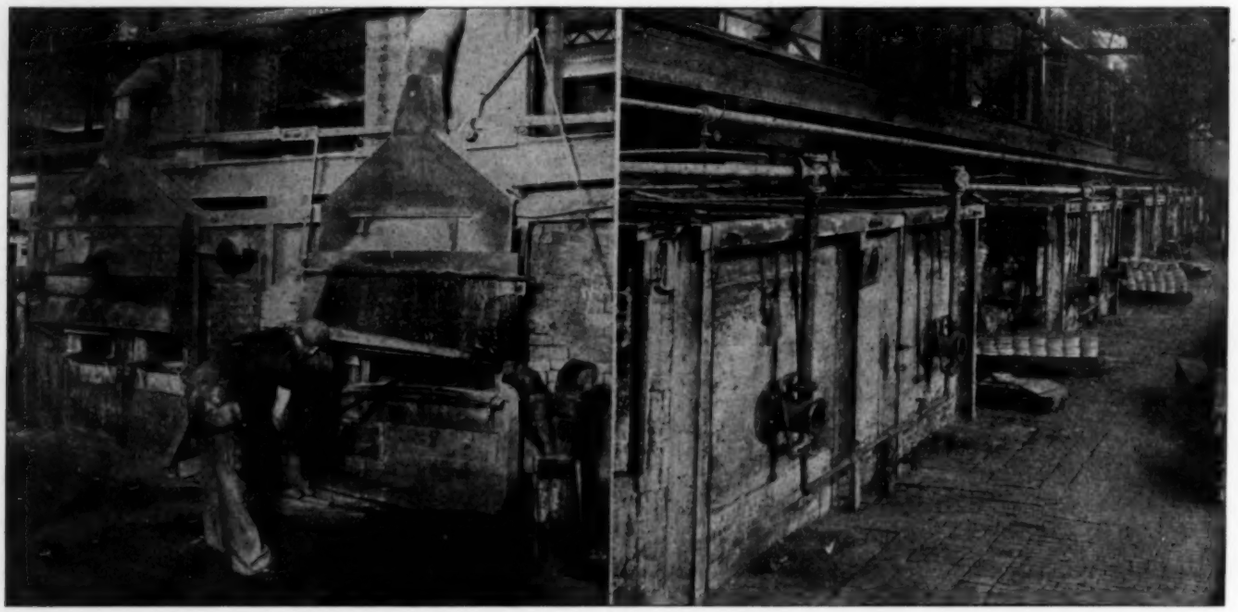


FIG. 2—FRONT VIEW OF HEATING AND PAIR FURNACES SHOWING CHIMNEY AND WATER-COOLED HEAD PLATE—REAR VIEW SHOWING BURNERS AND AUXILIARY AIR LINES

Maximum Scrap Prices Fixed by British

New maximum prices for steel and wrought iron scrap have been fixed by the British minister of munitions. They are per ton as follows:

Heavy melting steel, £5 5s ($25.20).

Steel turnings and borings, £3 10s ($16.80).

Mixed steel turnings and borings, £2 10s ($12.00).

Other classes of steel scrap, £5 5s ($25.20).

These prices are free on rail or free in barge at the nearest siding or wharf to the location of the scrap. Carriage charged to the buyer must not be in excess of 10s ($2.40) per ton.

Special permits to buy steel scrap on guaranteed analysis may be granted on application. In these cases the price on heavy melting steel containing not over 0.04 per cent phosphorus and sulphur must not exceed £6 5s ($30.00) and that on steel containing not over 0.05 per cent sulphur and phosphorus must not exceed £6 ($28.80). Clean wrought iron scrap prices must not exceed £6 5s ($30.00), or when mixed with steel or other materials £5 5s ($25.20). The maximum price on wrought iron turnings or borings mixed with steel or other material is £2 10s ($12.00). The maximum prices on wrought iron scrap if handled and delivered from the yards of recognized scrap merchants may be increased 10s ($2.40) per ton where the carriage to buyers' works does not exceed 3s ($0.72); by 7s 6d ($1.52) where the carriage exceeds 3s; and by 15s ($3.60) if the material is sheared and cut up, ready for piling.

The bureau of mines, department of the interior, Washington, has issued a chart on the subject of resuscitation from gas asphyxiation, drowning and electric shocks. This bulletin is suitable for posting at mines, industrial plants, and in other places where there is danger from asphyxiation, electric shock, etc. The chart shows the Schaefer or prone pressure method of artificial respiration, which is the latest and most approved method advocated by eminent physiologists in this country. The bureau has issued this chart with the hope of inducing the adoption of this standard method of resuscitation.

Casting Alloy Steel Mill Rolls

This Description of Methods Employed to Mold and Cast Mill Rolls Emphasizes the Importance of Metallurgy in Modern Foundry Practice —Care in Melting Steel is Essential

TALES of ancient history describing the battles of oriental chieftans and legends of sultans and shahs all weave into their lore glowing praises of the wonderful swords of Damascus. The excellence of these scimitars which could sever with equal ease heavy iron spears or delicate fabric floating in air was attributed by those warriors of old to the supernatural. Their high quality was responsible for the superiority of a race. Generation after generation tried to duplicate the steel of these weapons, but the reputation of Damascus swords remained intact throughout the ages until, finally, in the last half of the nineteenth century blades made from the deposits of iron in the Ural mountains proved by their ability to retain a keen edge that the famous steel had been duplicated. The association of mysticism with the production of such steel was not entirely eliminated until the advent of the modern metallurgist whose analyses explained with simplicity the far-famed superiority of Damascus steel. The presence of small percentages of tungsten in the ore from which these swords were made doubtless accounts for the flexibility and the sharp cutting edges. Metallurgy has also served to explain why Swedish iron and Sheffield steel have been famous for years for their good qualities in their respective fields. Further than this, metallurgy has enabled us to duplicate with ease steels renowned for years and it has led the way to the production of various alloy steels which surpass by far the most wonderful product of the ancients.

The rapid advances made in the science of metallurgy during recent years and the widespread and thorough study of the structures of steel and their relations to the characteristics of alloys have immeasureably broadened the fields to be exploited by the producer of steel and the maker of its products. The industrial laboratory with its corps of skilled metallurgists and chemists is an essential part of many modern plants. As the field becomes more and more familiar and as the value of high-carbon and alloy steels becomes more generally appreciated, the uses of such materials will be broadened, and, undoubtedly, new ones will be delevoped. One of the pioneers in the production of alloy steels is the Pittsburgh Iron & Steel Foundries, Midland, Pa. The several alloys produced by this company are adapted to a wide range of application including mill rolls, gears, pinions, bending dies, crusher jaws, etc. One of the most interesting products of the Midalnd foundry is mill rolls.

In developing alloys containing a high percentage of carbon and several other constituents such as nickel and chromium to successfully resist the wear and tear of hard usage, the company's metallurgists took radical steps and departed largely from accepted practice, seeking not only to improve old alloys, but also to develop new ones. For example, the proportion of chromium to nickel in one of the company's standard alloys is approximately 2:1; the carbon content averages from 1.8 to 2 per cent. Tests of this steel indicate that it is tough and strong and that it is highly resistant to wear and abrasion. The peculiar characteristics of the steel used to make mill rolls makes a discussion of their production from the pattern to the finished roll of interest to those intimately connected with mill operation. The foundry problems arising during the casting of these rolls furnish some attractive features.

The shapes of mill rolls lend themselves readily to molding with sweep patterns. This at once simplifies the making of the patterns and the molding of the rolls. Patterns for rolls are usually made in the company's pattern shop from drawings furnished by customers. This shop employs five men and is equipped with modern woodworking machinery including planers, a band saw, jointers, etc. Each pattern is designed to mold a complete roll including the shrink head, the necks and the outline of the wobbler. A typical pattern is shown in Fig. 1. The smaller patterns resting under the sweep are the two sections used to form the wobbler. The illustration indicates clearly the braces which are used to clamp the sweep to a jig operating the sweep in the flask. Adjacent to the pattern shop is a pattern storage room from which the patterns are checked to the foreman in charge of the molding gang.

The rolls are molded in steel flasks which are first filled partially with floor sand for backing. They are handled in the largest of two bays which make up the 150 x 300-foot heavy molding shop. After being filled to the proper height and rammed, silica facing sand is placed in the flask, pipes approximating the

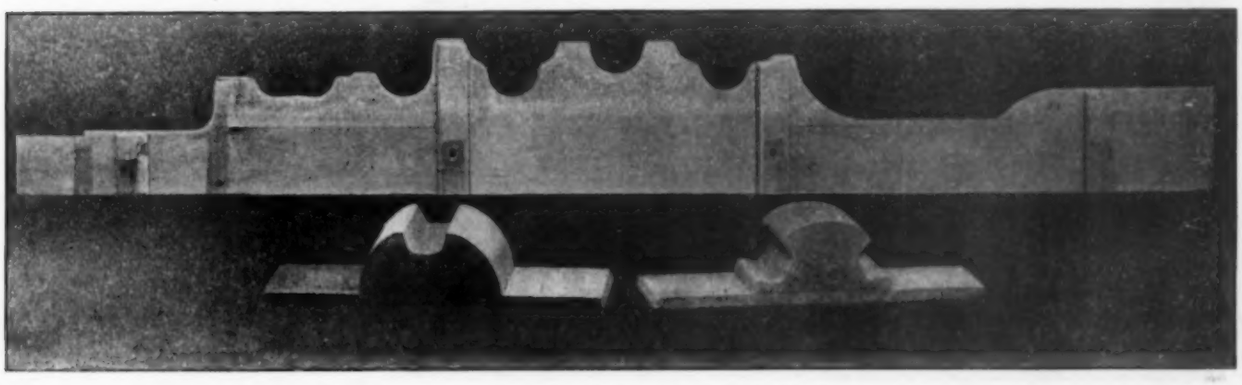


FIG. 1—SWEEP PATTERN USED FOR MOLDING MILL ROLLS

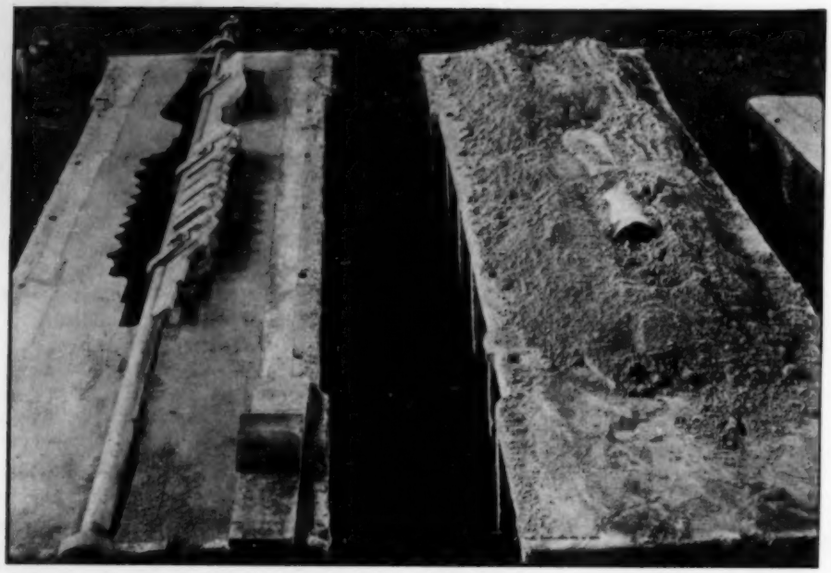


FIG. 2—THE FLASK AT THE RIGHT IS READY FOR FINAL RAMMING; THE PIPES IN THE SAND REDUCE THE AMOUNT OF FACING SAND REQUIRED—THE MOLD AT THE LEFT IS READY FOR MOLDING THE WOBBLER

shape and size of the rolls being laid in the center, as shown at the right in Fig. 2, to reduce the amount of facing sand required and to shorten the time necessary to sweep this sand from the flask. After the facing sand has been sufficiently rammed, the pipes are withdrawn and the sweep is put in place and the sand scooped out forming the mold of the roll. In Fig. 2 one flask is shown with the facing sand and pipes in place; and the other as it appears when finished. The sand is supported in the flasks by a large number of gaggers, there being on an average of 100 to each mold. The sand is rammed partially by hand and partially by portable air rammers made by the Ingersoll-Rand Co., New York. On most of the molds for mill rolls, the wobbler is formed with the roll mold by placing the wobbler pattern in the semicircular space provided for by the sweep, ramming sand under the pattern. On a few rolls of special character, the wobbler is cast as a solid rim of metal and is finished on a planer in the machine shop. When the rolls are designed to be carried on a shaft in the mill housing, the mold carries a plain cylindrical core. With the exception of the part of the mold made with the wobbler patterns, the drag and the cope are exactly the same shape.

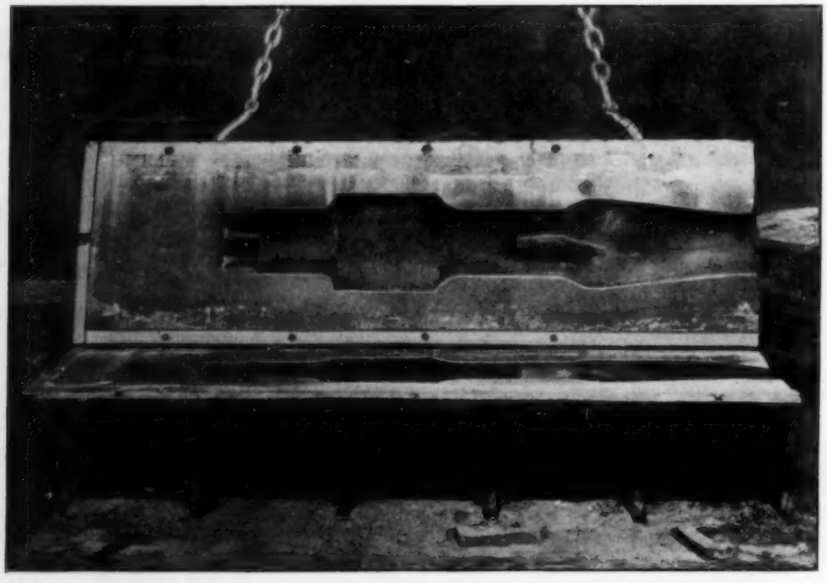


FIG. 3—BAKED MOLD READY TO BE CLOSED FOR POURING

After the mold has been completed, nails are placed to support the sand and to prevent it from mixing with the molten steel and causing the occurrence of sand holes in the casting. The mold is prepared for baking by painting with a mixture of silica wash and molasses.

The work of molding mill rolls is handled by 13 men who mold approximately 25 rolls in a 10-hour shift. Molds made one day are dried over night and are poured the following day, thus providing for practically continual pouring. Sealing is accomplished by the use of asbestos ribbon which is said to be more substantial than clay and to prevent the formation of fins. The molds are dried in oil-fired ovens at a temperature of 600 degrees Fahr. for a period of nine hours.

Gating is accomplished by placing a 3½-inch pipe in the sand, withdrawing it and cutting through from the mold to the hole thus formed. The head is formed by the sweep and is shown clearly in Figs. 3 and 4. The molds are placed in two large pouring pits located in close proximity to the open-hearth furnaces so that there is little opportunity for the molten metal to cool while being transported from the furnaces to the molds. The molds are poured while in an upright position. Approximately 25 per cent of the metal cast is taken up by the head which is of such proportions that it is possible to keep the metal in this portion of the mold in a fluid state until the mill-roll portion has solidified. The molds are handled by a 25-ton and a 10-ton Morgan traveling crane. This service will be augmented shortly by a second 25-ton crane which has been ordered from the same builder.

Metal for mill rolls is prepared from pig iron and scrap steel. This material is conveyed from the stock yard to the charging platform of the open-hearth furnaces or to the cupolas by a 5-ton traveling crane. An unusual feature in regard to the steel used for mill rolls by the Pittsburgh foundries is the high percentage of carbon. This element is added to the steel in the form of high-carbon pig. If the chemist's report indicates that the percentage of carbon is too high, the amount is reduced by adding low-carbon scrap. Closer control in the addition of carbon is secured by stirring with a wooden pole. Chromium, nickel and manganese constitute the alloying metals added to the steel. Tests of the steel are made in a well-equipped chemical laboratory from samples taken from the furnace. Analyses are sent to the

furnaceman so that he may adjust the proportions of the constituents to meet the specifications. A final check analysis is made of each heat. These furnaces melt about 75 tons of steel a day. The materials are charged into the two open-hearth furnaces by means of an electric charger which was built by the user. Both furnaces are arranged to burn either oil or gas. The change from one fuel to the other may be made with but a few minutes' delay.

The exceptionally long life of the refractories used in these furnaces is a noteworthy feature. The average life of a lining is about 1350 heats; the checker brick has lasted for as many as 2500 heats. The silica lining refractories used in these furnaces have been supplied by the Mt. Union Silica Brick Co., Mt. Union, Pa., and the Harbison-Walker Refractories Co., Pittsburgh. The checker bricks were made by the McLain Fire Brick Co., Pittsburgh.

After the rolls have been taken from the molds they are annealed, rough cleaned and sent to the machine shop where they are finished and prepared for shipment. Fig. 4 shows some of the molds waiting to be rough cleaned. The annealing is taken care of in five large gas-fired ovens arranged as pits, 15 x 25 x 9 feet. It is a most important element in the production of mill rolls. In loading the ovens, an effort is made to have all the rolls in one charge of a uniform cross-section so they all will be subjected to the same annealing. The temperature is recorded by pyrometers made by the Bristol Instrument Co., Waterbury, Conn., and the Brown Instrument Co., Philadelphia. Test pieces that are placed in the ovens are broken to gage the nature of the annealing by the fracture.

The smaller bay of the large molding shop is devoted to the production of ingot molds. This part of the shop is served by a 20-ton and a 5-ton crane made by the Morgan Engineering Co., Alliance, O., and a 10-ton crane made by the Shaw Electric Crane Co., Muskegon, Mich. Molders working from a large square ramming platform form the molds around core barrels placed in core-box forms. Loam sand is used at the bottom and the top of the molds; the remainder is floor sand. The molds have a 3-inch sprue with a 1 x 4-inch gate. Chill cover plates are used on the tops of the molds. After sealing with clay, the molds are baked for nine hours in coke-fired ovens which are sunk to the level of the floor to save transferring to oven cars. The bessemer iron used for these molds is melted in 55 and 72-inch cupolas having capacities of 15 and 25 tons per hour, respectively. These cupolas are used to melt on an average of 300,000 pounds of iron a day. The ingot molds are poured in a special pit. The molds weigh from 1500 to 2700 pounds.

Shop for Small Castings

Smaller castings of both iron and steel are molded in a 150 x 300-foot shop equipped with a 25 and a 10-ton Morgan traveling crane. Molding here is done entirely with green sand in flasks or on the floor. This department is devoted to the production of dies, gears and similar castings. The metal is brought from the open-hearth furnaces and cupolas in ladles carried on small cars drawn by a gasoline locomotive. This structure also provides space for coremaking and cleaning, chipping and machining miscellaneous castings.

Accident prevention and safety measures are prominent features of this plant. Fire-fighting apparatus is located conveniently about the plant. Numerous bulletin boards call the employers' attention to various safety notices and suggestion boxes encourage co-operation. A first aid room is provided for injured employes. The safety work is directed by a committee of five composed of the heads of each department. This committee meets weekly. Sub-committees of five men in each department meet at four-week intervals to make suggestions and recommendations to the executive committee.

FIG. 4—MILL ROLLS WAITING TO BE CLEANED—NOTICE THE LARGE HEADS

Furnace Orders Taken

The Electric Furnace Construction Co., Finance building, Philadelphia, which recently was organized as the American branch of T. H. Watson & Co., Ltd., Sheffield, Eng., already has secured contracts for the installation of a number of 6-ton electric furnaces, of the Greaves-Etchells type, in this country. One is to be installed for the government at Puget Sound, another at Pearl Harbor, and another at the Norfolk navy yard. In addition, one Greaves-Etchells furnace will be installed at the American Radiator Co.'s plant at Buffalo and one at the plant of the Singer Mfg. Co., Elizabeth, N. J. In addition to the furnaces, the Electric Furnace Construction Co. is furnishing the American Radiator Co. and the Singer Mfg. Co. with general designs for buildings and plant equipment. The Greaves-Etchells furnace was developed about two years ago by H. A. Greaves and H. Etchells, of Sheffield. Prior to the opening of the American branch, 30 units had been successfully installed in England and Scotland and one in France. Since then, orders have been received for one 6-ton and two 12-ton furnaces to be installed at the plant of Vickers Co., Ltd., Sheffield, Eng.

The Wayne Oil Tank & Pump Co., Fort Wayne, Ind., has just completed three additions which have doubled the company's manufacturing facilities. Recently the company acquired four acres of land adjoining its present holdings. This tract will be used as a site for an addition to the heavy-metal tank shop.

Cast Iron—Its Rust Resisting Power

The Corrosion Properties of Cast Iron Have Not Been Thoroughly Investigated —Recent Experiments, However, Seem to Indicate That They Refute the Electrolytic Theory

BY E. A. AND L. T. RICHARDSON

IN REVIEWING the literature relating to the corrosion of cast iron, one is unable to find any extensive references or data. This fact seems rather surprising when the many scientific tests and observations that have been made upon the corrosion of iron and steel are taken into account, the published results of which make an extensive and varied literature. The field of cast iron as regards its usefulness as rust-resisting metal has been much neglected, and today remains almost unexplored.

This is due partly to the fact that only in the last few years has the resistance of iron to corrosion been considered one of its important properties. The efforts to improve materials for structural and other purposes have been directed toward the production of a material having superior physical properties, such as tensile strength, and possessing a greater reliability. For this reason cast iron, which once was used extensively for structural purposes, has been largely replaced by steel. Cast iron is still, however, used in enormous quantities in places exposed to corroding influences and in view of this fact it is surprising that the study of the corrosion of this material has not received more attention.

The Subdivisions of Corrosion

Most of the published information relating to the corrosion of cast iron may be divided into two classes. The first of these classes consists of isolated instances where pieces of cast iron have withstood the ravages of time and corroding influences and seem to have been almost unacted upon. The second class consists of actual tests in which attempts have been made to compare the rust-resisting properties of cast iron with those of iron and steel.

The information contained in the first class will not be discussed here. It will suffice to say that many instances are known where cast-iron objects have lasted many years, even centuries, and have remained in good condition when exposed to corrosive conditions. These observations are especially interesting in throwing some light upon the electrolytic theory of corrosion which states that the more heterogenous the material the greater its rate of corrosion. According to this theory, pure iron, steel and cast iron should resist corrosion in the order named. For more complete data on this subject, the reader is referred to "The Rusting of Iron," by J. Meehan and "External Corrosion of Cast Iron Pipe," by M. R. Pugh.

Experimental Tests

J. N. Friend tested gray cast iron and mild open-hearth steel by an alternate wetting and drying method, and found that cast iron was superior to steel. Thwait collected in 1880 all available data upon the corrosion of cast iron compared with that of wrought iron, and obtained for the relative corrosion the following results:

	Pure air	City or sea air
Wrought iron	0.655	6.690
Cast iron	0.604	2.637
Cast iron (skin removed)	0.584	4.763

Burgess and Aston tested several kinds of iron and steel under atmospheric conditions, among which were cast iron, steel and pure iron. They found the relative corrosion to be:

High purity iron	88.4
Steel	63.5 to 150
Cast iron	93.0

In regard to these tests they say, "Heterogeneity in structure of metals is generally supposed to be antagonistic to durability but this investigation shows that if it is a factor it is one of secondary significance and overshadowed by other factors."

It is evident, therefore, judging from the literature, that cast iron, in spite of its extreme heterogeneity, is rust-resisting. The data upon this subject, however, is meager and conclusions can not be drawn from results so radically different from the predictions of such a widely accepted theory as the electrolytic until sufficient data has been obtained to warrant doing so.

The Test and Its Results

In order to add to the information already obtained upon this subject, the authors themselves conducted a test. Three kinds of iron, typical of three stages of heterogeneity were chosen: gray cast iron, a low-carbon steel and a commercially pure iron. By analysis these materials contained the following impurities:

	Sulphur	Phosphorus	Manganese	Total carbon	Silicon	Copper
Cast iron	0.059	1.020	0.480	3.260	2.400	none
Steel	0.030	0.006	0.330	0.100	trace	trace
Pure iron	0.021	0.004	0.015	0.015	0.005	0.025

For the test, four pieces of each material were taken and carefully annealed at 750 degrees Cent., the effects of oxidation removed by filing and then accurately weighed. The pieces were all given identically the same treatment.

The test materials were examined at intervals of about one week. At the end of a month, visual observations indicated pure iron to be the best material for resisting corrosion, while cast iron and steel seemed about equal although decidedly poorer than pure iron. Later on, the rate at which the cast-iron specimens were rusting decreased and at the end of about four months cast iron and pure iron were about the same, while steel was poorer than either.

At the end of seven months the test pieces were removed, cleaned with neutral ammonium citrate and carefully reweighed. The losses computed in grams per square centimeter were:

Cast iron	0.966
Steel	1.546
Pure iron	0.771

The specimens, after cleaning, were examined in regard to condition of surface, depth of pits and uniformity of rusting. No difference could be detected between the cast iron and pure iron as regards these three points; in fact they seemed to corrode in much the same manner. The steel was, on the contrary, deeply pitted, and the rusting on the surface had been irregular.

The results of this test agree with other tests and add to the evidence already accumulated, that the resistance of an iron to corrosion does not necessarily depend upon its purity or homogeneity, as would be indicated by the electrolytic theory of corrosion. This theory, in its present accepted form, does not explain the great resistance offered by cast iron. While it may be true that the initial rusting is largely electrolytic in character, other factors, such as the adherence of the rust and the protection thereby given to the metal, come into operation and outweigh any electrolytic corrosion—a conclusion arrived at by other observers.

A paper presented at a recent meeting of the American Electrochemical society.

War Forces Labor Change

Manufacturers of Refractories Consider Problems of Employment in Their Shops—Extension of Scientific Management is Predicted

Attended by about 50 plant superintendents and employment managers, the Refractories Manufacturers' Association of the United States held a session at the William Penn hotel, Pittsburgh, Oct. 11 and 12. The principal speaker was Dwight T. Farnahan, industrial engineer, New York. He gave some interesting data on changes in industrial methods which took place in England during and after the first year of the European war. He predicted more general application of scientific management to American industries not only in the immediate future but as a necessity in connection with the reconstruction period which will follow the close of hostilities. Mr. Farnahan, who investigated industrial conditions in England during the early part of the war and who has since been engaged in industrial and efficiency engineering, gave a brief tabulation of the principal elements of scientific management and analyzed all of these. He was followed by Miss Katherine Huey, formerly employment manager of the Curtis Publishing Co., who spoke on "A Centralized Labor Department". She referred to its benefits in the way of reducing the labor turnover and to the wastefulness of a hit-and-miss policy of hiring and "firing". She advocated the principle of putting an employe unfit for one department into another and of instituting a system of profit-sharing, pensions, insurance and proper welfare for the employes.

Richard D. Hatton, vice president of the Laclede-Christy Clay Products Co., St. Louis, was chairman of the operatives' meeting.

Reaffirms Bonus Finding

The Pennsylvania state compensation board, in a series of decisions just issued, reaffirms its finding that a bonus has to be counted into the wages of an employe in calculating compensation, as it is a special inducement for continued work. In another case it is held that payment of wages by an employer during disability of an employe from an accident does not constitute discharge of an employer's compensation liability unless an agreement is made and in the absence of such an agreement payments cannot be considered a defense to a claim.

The Lucerne county court has held that the jurisdiction of a court of common please in compensation cases is limited to appeals in which final decrees refusing or allowing compensation are involved.

New Wisconsin Law Gives Additional Benefits

The new Wisconsin workmen's compensation law of 1917, which has just gone into effect, materially increases all benefits to injured workmen. The most important items are the modifications in the schedule of fixed benefits, which materially lengthen the periods of the disability for all specific injuries involving amputations. The new law also increases the compensation recoverable in cases of permanent total disability to workmen in the prime of life. Hitherto indemnity for permanent total disability has been limited to six times the annual wage, regardless of the age of the workman. Hereafter, the maximum indemnity which workmen under 32 years of age may recover, if permanently totally disabled, is a fraction less than 10 times the annual wage, which sum is reduced in accordance with a regular schedule for workmen totally disabled later in life.

Another provision is that requiring the employer to pay burial expenses not to exceed $100 where death is a result. Still another provision of the new act gives increased compensation in cases of multiple injuries. In such cases the compensation will not be merely the sum due for each injury, but also an additional amount for the multiple character of the injury.

Another significant new feature is that providing for an increase of 10 per cent in compensation payments when there is inexcusable delay in making the same. The new law also provides for interest at the rate of 6 per cent upon all awards not paid when due. The act also provides that in no case shall the attorney's fees exceed 10 per cent of the amount recovered by the injured workman, nor more than $100.

The minimum and maximum annual earnings for purposes of computing compensation remain as under the old law; that is, the minimum is $375 and the maximum $750 per year.

The scope of the compensation act also has been somewhat modified. Instead of applying automatically to all employers usually employing four or more persons in a common employment, the new law applies to all who employ three or more workmen.

Takes Safety Measures

The first commissions to members of the Pennsylvania volunteer police are now being issued under the act of July 20, which authorizes appointment of men for emergency purposes during the war. The appointments are being made by the governor, but the names of all persons are passed upon first by local committees of public safety and then sent to the state committee af public safety, where they finally are considered. More than 450 men will be commissioned for eight counties. Others will be named from time to time for other counties and it is expected that by the end of the year there will be 3000 picked men, many of military experience, ready to serve on emergency call for any kind of duty.

Labor Notes

The New York Shipbuilding Corp., Camden, N. J., has announced a plan of life insurance for all its employes. Those who have been employed less than two years are insured for $500, and for every additional year the amount is increased $100. The company pays the premiums and bears all the expenses.

The Pratt & Whitney Co., Hartford, Conn., announces to its 3000 employes the payment of a monthly bonus of 12½ per cent above the regular wages now being paid, effective Sept. 4. The payment will be conditional on the service of the men, who are expected to work full time that the factory is running, except one day's absence a month and except in case of serious illness. The payroll now is about $60,000 a week, and the bonus, therefore, will be about $30,000 a month.

Between 200 and 300 iron molders and helpers employed by the Vulvan Iron Works, New Britain, Conn., are on strike for $4 for nine hours' work, time and one-half for overtime, $4 per day for piece workers and a bonus of 30 cents on a dollar with the provision that the bonus shall not be taken away if a man does not work a full week. The laborers want 35 cents per hour with the time and one-half pay for all over nine hours' work, with the bonus provision.

The James A. Brady Foundry Co., Chicago, has increased its capital from $25,000 to $300,000.

Mining Engineers Meet in St. Louis

China Said to Have But Little Iron Ore—Large Manganese Ore Deposits in Costa Rica—Over Sixty Papers Read and Discussed —Iron and Steel Session Important

MINING engineers today probably cover a broader field of activity than any similar group of technically trained men. They deal not only with the extraction of ores and mineral resources of all sorts, but with their economical reduction into useful metals, oils, acids and other products. They find it necessary in addition to give attention to finance, business administration, government control and regulation, welfare work, transportation, etc.

The growing diversity of the mining engineer's interests and activities was clearly portrayed in the proceedings of the 115th meeting of the American Institute of Mining Engineers, held in St. Louis and Joplin, Mo., and Tulsa, Okla., from Monday to Friday of last week. There were nine technical sessions at which 65 papers were read. Sessions were held on milling, coal, lead, petroleum, ore deposits, zinc, iron and steel, and miscellaneous topics. An unusually large number of plant inspections also were made.

In addition, a patriotic meeting was held Monday afternoon. It was featured by an address by Capt. Robert W. Hunt, Robert W. Hunt & Co., Chicago, in which a ringing appeal for citizenry united for the one purpose of extirpating German agression was voiced. Capt. Hunt is one of the long line of distinguished past president, of the institute.

Iron Ores Hold Center of Stage

The iron and steel session, held Wednesday afternoon at the Planters hotel, was characterized by papers dealing with the occurrence of iron and manganese ores in various parts of the world. Most of the discussion centered around papers by E. C. Harder and Chung Yu Wang on the manganese ores of the Cuyuna range and the iron ores of China, respectively. E. G. Spilsbury, mining engineer, 45 Broadway, New York, past president of the institute, acted as chairman in the absence of Prof. Joseph W. Richards, Lehigh university, chairman of the iron and steel committee, who was delayed by a railroad accident.

The initial number on the program was a paper by E. C. Harder, geologist, school of mines, University of Minnesota, entitled "Manganiferous Iron Ores of the Cuyuna District, Minnesota". This paper, as mentioned in the preliminary report of this meeting published last week, appeared in the Sept. 27 issue of THE IRON TRADE REVIEW. In the absence of the author, the paper was read by Edmund Newton, metallurgist, mines experiment station, school of mines, University of Minnesota.

At the conclusion of the presentation of the paper, Mr. Newton discussed the Cuyuna manganiferous ore problem informally. He pointed out the difficulties that have been experienced in beneficiating these ores, due, he said, to a number of causes, chief among which is the lack of sufficient gradation in the specific gravities of the ores and the gangue. The most satisfactory method of beneficiating these ores, he explained, is by hand picking and selective mining. It is difficult, he continued, to dephosphorize these ores, one reason being that it is not yet known how the phosphorus occurs. Any attempts to beneficiate resulting in an increase in manganese have been accompanied by a corresponding increase in phosphorus. Some experiments have been made on leaching the Cuyuna manganiferous ores with sulphuric acid. The difficulty in this case has been to devise economical methods of precipitating the manganese from solution.

Mr. Harder's paper contains the statement that few Cuyuna range manganese ore deposits contain over 500,000 tons of available material. Mr. Newton, however, referred to a deposit recently brought to light through the work of the Minnesota tax commission which contains about 7,500,000 tons. It averages 35 per cent iron, 10 per cent manganese and 0.270 per cent phosphorus. It, therefore, has little metallurgical value at present, except as a mixing element in ores used for making basic pig iron. It may be used for this purpose to increase the manganese content of the pig.

Deposits in Costa Rica

E. G. Spilsbury described some interesting manganese deposits in Costa Rica, where there is an ore formation extending for 150 miles along the Pacific coast. It is very persistent, and occurs in the foothills of the coast range. The deposits are somewhat disconnected. Where the disturbance of the porphyritic shale has been most extensive, the deposits are not as large as at other points, but the concentration of manganese is more pronounced, resulting in rich ores running 45 to 52 per cent manganese and 4 to 5 per cent silica.

Not Much Ore in China

An exceedingly interesting paper on "The Tayeh Iron Ore Deposits", by Chung Yu Wang, geologist and mining engineer, Panoff Garden, Rue de Saigon, Hankow, China, was presented in the absence of the author by Thomas T. Read, New Jersey Zinc Co., New York. A portion of Mr. Wang's paper follows:

"The deposits are situated to the west of the Yangtse river, being connected with the river by a standard-gage railroad of 56 li (16.16 miles) in length. The general topography of the region is of mature age, showing broad valley with sluggishly meandering streams. These deposits are worked as two mines, named the Tieh Shan Mining Department and the Teh Tao Wan Mining Department; the former consisting of three ore bodies more or less connected, named Tieh Man Kan, Sha Mau Tze and Lung Tung, and the latter consisting of Chang Pei Shan, Sze Tze Shan, Ta Shih Men, Yeh Chih Ping and Tsin Shan, also more or less connected.

"The deposits lie along the contact between an igneous instrusion, belonging to the hornblende-syenite group—the syenite of Read, diorite of Seltzer, and hornblende-granite of Weld—and limestone. The hornblende-syenite, invariably in a decomposed condition along the whole length of the contact, presents the appearance of a decomposed alkaline aluminum silicate rock of a light brownish color, sometimes, though rarely, with a greenish tint to it, which is due to the greenish color of the partially decomposed hornblende. The essential minerals forming this rock, being medium-grained and of inequigranular fabric, are orthoclase and hornblende. The various stages of decomposition of the orthoclase mineral—from the fresh colorless crystals to a dull whitish kaolin product—can be clearly discerned with a field lens. It must be remarked here that there are two varieties of hornblende-syenite—the one, dark gray, near the partially decomposed rock next to the ore-bodies; the other, mottled white, which is farther off from the deposits and can be found as boulders and pebbles along the streams. The limestone occurs in various stages of crystallization, in which hardly any trace of contact minerals can be found. I am indebted to my assistant, W. A. Wong, for having found a layer of limestone thickly studded with crystals of garnet, not far from the ore body; the only layer of limestone with such

contact mineral that I saw during my stay in Tayeh.

"The output of iron ore from 1896 to 1914, inclusive, in round numbers, was about 3,500,000 tons. The ore in sight of these deposits, including Chang Pei Shan, which, being government property, has not yet been opened, has been estimated by three engineers to be 20,000,000, 30,000,000 and 100,000,000 tons, respectively. But according to my judgment, it would not be unreasonable to regard the ore in sight as 30,000,000 tons and the probable ore in depth as 30,000,000 tons."

One analysis of this ore gave the following results: Iron, 62.93 per cent; sulphur, 0.029 per cent; phosphorus, 0.049 per cent; copper, 0.238 per cent; and silica, 5.42 per cent. Another typical analysis gave the following results: Iron, 59.45 per cent; manganese, 0.63 per cent; sulphur, 0.319 per cent; phosphorus, 0.109 per cent; alumina, 1.05 per cent; copper, 0.292 per cent; and silica, 9.16 per cent. The specific gravity in these cases was 4.64 and 4.13, respectively.

Chinese Ore Disappointing

Mr. Read, who has studied iron ores in China, commented on the paper by pointing out that up to date the Chinese ore deposits have proved disappointing, both as to quality and quantity. This is contrary to general belief which credits China with enormous iron ore reserves. The Tayeh deposits, Mr. Read pointed out, are hardly extensive enough to permit fulfilling a contract made some time ago with a Japanese steel works. Most of the other known ore bodies in China, he said, are controlled by the Japanese, but up to the present time no very extensive deposits have come to light. While China, therefore, he said, may expect to support a considerable iron and steel industry, it will not be possible for it to rival either the United States or Europe. In brief, no large steel industry can be developed in the orient unless much more extensive ore bodies are located.

A paper entitled "The Ferrous Iron Content and Magnetic Susceptibility of Some Artificial and Natural Oxides of Iron", by R. B. Sosman and J. C. Hostetter, geophysical laboratory, Carnegie institute, Washington, D. C., was read by title.

The same authors also presented a paper entitled "Zonal Growth in Hematite and Its Bearing on the Origin of Certain Iron Ores".

Dr. Henry M. Howe, emeritus professor of metallurgy, Columbia university, New York, contributed a paper on "The Supposed Reversal of Inheritance of Ferrite Grain Size from That of Austenite". The paper states that data which the author has collected show that, "the ferrite of low-carbon steel and of electrolytic iron, like the network of hypo- and hypereutectoid carbon steel, inherits, either absolutely or relatively, the grain size of the mother austenite from which it is born in cooling through the transformation range. This evidence is so abundant and concordant as to cast doubt on Prof. Jeffries, hypothesis of what might be called reversed inheritance, by which he explains Mr. Ruder's observation that the grain of a 'slug of pressed pure electrolytic iron powder' were coarser after a three-hour exposure to 1000 degrees Cent. than after a three-hour exposure to 1250-1300 degrees. His explanation implies a natural tendency of coarser austenite grains to yield finer ferrite ones than spring from finer austenite grains, so that the inheritance is reversed.

A Simpler Explanation

"What seems to me a simpler explanation is that the enormous grains which followed the 1000-degree heating were not inherited from the mother austenite, but were formed by the process of natal coarsening, by means of which Stead and Carpenter developed grains of this same order of magnitude in this same kind of material, on heating to 950 degrees or to 1000 degrees, the temperature used by Mr. Ruder, provided the exposure was not unduly prolonged, and it does not seem to have been in Mr. Ruder's case. That their coarsening was natal not through inheritance is shown first by the fact that their grain coarseness was out of all proportion to their relatively low temperatures and short periods, and hence was very far in excess of the grain size which the mother austenite must have had, and second and more cogently by the fact that the shape of these coarsened grains was evidently determined by the temperature distribution which existed during and immediately after the Ar_3 transformation, that during the passage from the gamma to the non-gamma state.

"In discussing this subject, we must remember that coarse ferrite grains, whether those formed in cooling from the molten or those induced by Stead and Carpenter's process of natal coarsening, break up on transforming into austenite at Ac_3 on any later heating, the coarsening of ferrite not being inherited by the austenite. Further, that the size of the new ferrite grains formed in case natal coarsening does not occur, depends on the grain size not of the initial ferrite but of the mother austenite, and hence increases with the length and height of heating beyond Ac_3. Hence, in Mr. Ruder's second or 1300-degree heating, the coarse initial grains of ferrite formed natally in the Ar_3 transformation after his prior 1000-degree heating, and representing not that heating but that transformation, broke up on rising past Ac_3 in his next heating, which was to 1300 degrees. The ferrite grains which would next form on cooling past Ar_3 would inherit the austenite grain size formed in this 1300-degree heating, and would have no tendency to resume the now effaced enormously greater size given natally during the prior Ar_3 transformation. I do not mean to assert that the austenite grain size is wholly irrelated to that of the pre-existing ferrite, but rather than the grain-size relation of parent to offspring is far closer in the austenite-ferrite or Ar than in the ferrite-austenite or Ac transformation."

Henry S. Rawdon, associate physicist, bureau of standards, Washington, D. C., contributed a paper entitled "Some Unusual Features in the Microstructure of Wrought Iron". In summarizing his conclusions, the author makes the following statements:

"Wrought irons high in phosphorus sometimes show a peculiar mottled or banded intracrystalline pattern, which by comparison with alloys of pure iron and phosphorus is shown to be due to a non-homogeneous diffusion of the phosphorus. The examination of a wrought iron member exhibiting such an unusual structure showed that the break which occurred in service bore a definite relation to such banded markings and apparently was largely determined by them. By the non-homogeneity in the distribution of phosphorus throughout the ferrite crystals, the ill effects of phosphorus may be much enhanced. The examination of a series of wrought irons showed that such features are not to be regarded as common. Many poor grades of iron may be unsuitable for other reasons. A second type of markings, the well known Neumann line, bear no apparent relation to the other variations in structure described."

Nonferrous Sessions

In addition to the iron and steel session, a number of sessions were held on the mining and metallurgy of nonferrous metal, including particularly zinc and lead. Among the specially interesting papers presented at these sessions were the following: "Coal Wastage", by Francis S. Peabody, president, Peabody Coal Co., Chicago; "The Practical Value of Oil and Gas Bureaus", by W. G. Matteson, geologist, Empire Gas & Fuel Co., Bartlesville, Okla.; "The History and Legal Phases of the Smoke Problem", by Ligon Johnson; "The Sulphur Deposits in Culberson county, Texas", by William B. Phillips, minning engineer, Austin, Tex.; "The Zinc Ores of the Joplin District", by W. George Waring; "The Estimation of Petroleum Reserves", by Robert W. Pack; and "Increasing Dividends Through Personnel Work", by Thomas T. Read, New Jersey Zinc Co., New York. The latter paper will appear in a later issue of THE IRON TRADE REVIEW.

Mr. Matteson's paper on "The Practical Value of Oil and Gas Bureaus" created considerable discussion on governmental control of natural resources. In discussions submitted by E. G. Woodruff, geologist, Producers' Oil Co., Houston, Tex., and I. N. Knapp, mechanical engineer, Ardmore, Pa., the disadvantages of government control such as that advocated by Mr. Matte-

son are comprehensively pointed out.

The war minerals committee of the institute held several sessions during the meeting. At one, H. A. Buehler, state geologist, Rolla, Mo., emphasized the importance of Missouri pyrites in the manufacture of sulphuric acid. He said the production of this acid in 1916 was 6,250,000 tons, but in order to carry on the war, this year and next 8,000,000 tons will be needed.

Attractive Entertainment

An exceedingly interesting and varied entertainment program was provided, including plant inspection trips, dinners, dances, a boat ride and a reception at the St. Louis home of Philip N. Moore, president of the institute. Among the iron, steel and machinery establishments visited were the plants of the Commonwealth Steel Co., American Steel Foundries and National Enameling & Stamping Co., Granite City, Ill., and the Wagner Electric Co., Curtis Mfg. Co. and Busch-Sulzer Diesel Engine Co., St. Louis.

On Wednesday evening a special train was provided to carry the members and their guests to the Joplin lead and zinc districts and the Oklahoma oil fields, where inspection trips were made and professional sessions held on Thursday and Friday.

Better Correspondence Is Convention's Aim

Fully 200 representatives of the large industrial concerns in the United States interested in better business correspondence gathered at the administration building of the Norton Co. in Worcester, Mass., Monday and Tuesday, for the purpose of organizing a national association for mutual interests. It was the first convention of the kind ever held in the country and probably in the world. The fathers of the plan are Charles R. Wiers, Larkin Co., Buffalo; E. P. Cramer, Goodyear Tire & Rubber Co., Akron; L. A. McQueen, the B. F. Goodrich Co., Akron, and H. N. Rasley, for the past three years correspondence supervisor for the Norton Co. The latter was the first industry in Worcester to open such a department and as a result it discovered that most letters are ineffective and that methods of dictating and transcribing are wasteful. Prof. George I. Alden, president of the Norton Co., welcomed the delegates and E. H. Fish, chairman of the employe relations committee of the Norton Co., outlined the purpose of the convention. Many interesting papers were read at the sessions, a full account of which will appear in the next week's issue of THE IRON TRADE REVIEW.

Skilled Men

Drawn to War Industries Slows Up Other Detroit Plants

Detroit, Mich., Oct. 13.—War is draining many Detroit factories of skilled mechanics and this, coupled with fuel shortage and inability to get raw materials has caused a slackening to what otherwise would be the busiest period in the city's history. It has been estimated that the war has taken no less than 25,000 men from Detroit's motor car factories alone. Women are being employed in many instances to fill their places. This is true of the Packard, Maxwell and Cadillac motor car plants.

The government is calling for thousands of motor trucks and this industry is going ahead at an amazing pace. Thousands of tons of brass are being used here monthly in the manufacture of munitions. Record-breaking inventories carried by manufacturers are blamed for the disinclination of corporation heads to invest in Liberty loan bonds as these large stocks of materials have brought many up to the limit of their borrowing power at the banks.

J. G. Vincent, vice president of engineering, of the Packard Motor Car Co., is credited with having taken the leading part in the creation of the new liberty standardized aircraft motor. This motor is being turned out in the Packard plant, while parts are being produced in other factories in the city. It is being shipped to France in ever increasing numbers. It has developed as high as 360 horsepower in government tests and is much lighter than any machine yet produced, on a horsepower comparison. Mr. Vincent has been commissioned a colonel in the signal service. The equipment division of the signal service which is supervising the building of liberty motors in this district has been established in the Garfield building, Detroit, with Maj. Mixture in charge.

The Barnes Foundry & Mfg. Co. will start work in a few weeks on the first unit of its 31-acre plant in Detroit. The plant will cost $350,000. Esseltyn, Murphy & Hanford, engineers and architects, expect to have it in operation by February. Gray iron castings will be manufactured. Clare L. Barnes is president; George W. Smith, vice president, and Charles E. Pelton, secretary and treasurer.

The Lozier Motor Co. has leased the plant of the Standard Auto Truck Co., in Detroit, and will begin the manufacture of motor cars.

The Torcrete Shipbuilding Co. is negotiating for a site in Detroit for the establishment of a shipyard in which it is proposed to construct reinforced concrete ships of 1200 tons displacement. Torcrete is described as a combination of steel and concrete which may be used in creating a laminated hull inside steel reinforcing. It is applied under air pressure.

The Paige Detroit Motor Car Co. has acquired the plant of the Williams Bros. Co., in Detroit, in which it will manufacture trucks and pleasure cars. Alterations are under supervision of Charles S. Pike, manager of sales.

Discovery of additional iron ore deposits is reported from the Crystall Falls, Mich., district. The land is held by the Michigan Mineral Co., of which Walter Prickett, of Sidnaw, Mich., and William Mather, Cleveland-Cliffs Iron Co., are large stockholders.

To Make Electric Steel

The West Michigan Steel Foundry Co., Muskegon, Mich., will install a 3-ton Booth-Hall electric steel furnace, capable of producing 30 tons per 24 hours. This is the same size as the Booth-Hall furnace which will be put in operation by the Midland Electric Steel Co., Terre Haute, Ind., early in November.

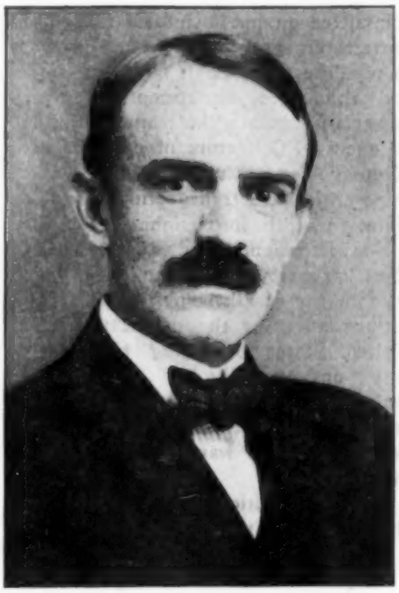
The Duriron Castings Co., Dayton, O., will install a ¾-ton Booth-Hall furnace for producing the special noncorrosive Duriron. Another Booth-Hall electric steel furnace of 1½-ton holding capacity will be put in operation the latter part of November by a company the name of which is withheld for the present.

Licenses have been granted by the United States Steel Corp. for the installation of the following heroult electric furnaces: American Bridge Co., Gary works, Gary, Ind., one 6-ton furnace, for castings and forging ingots; Hess Steel Corp., Baltimore, four 6-ton furnaces, which are additional to two 6-ton furnaces previously installed, for forging ingots; Twin City Forging & Foundry Co., Stillwater, Minn., one 3-ton furnace, for castings and forging ingots; Watertown arsenal, Watertown, Mass., one 2-ton and two 6-ton furnaces, for castings and forging ingots.

The American Steel Export Co. has issued a new 24-page pamphlet giving the groups of countries and lists of materials affected by the President's proclamation and subsequent orders, together with facsimilies of forms prescribed and an explanation of their use.

Obituaries

EDMUND STEYTLER, aged 48, general manager of sales of the Pittsburgh Steel Co., died Oct. 8 at the Hotel Strand, Atlantic City, N. J., where he had gone in an effort to recover his health. Mr. Steytler was born in Cape Town, South Africa, and came to this country with his parents at the age of five years. The family residence was at Swissvale, Pa. He received his education at Trinity Hall, now Washington and Jefferson College, Washington, Pa., and, after graduating, entered business



EDMUND STEYTLER

with his father who was operating the Youghiogheny Coal Co. In 1893, he became associated with the Bindley Hardware Co. and the Pittsburgh Wire Co., where he remained until 1896, when he went with the Consolidated Steel & Wire Co., in charge of the field fence department. In 1898, the Consolidated Steel & Wire Co. was merged into the American Steel & Wire Co., and Mr. Steytler was removed to the New York office of the company in the fence department, where he remained until 1902. Resigning his position at this time, he associated himself with the Pittsburgh Steel Co. to take charge of the electric welded woven wire fence department. In 1912, he was appointed general manager of sales of the company and served in that position to the present time. Mr. Steytler was a member of the Duquesne, Oakmont, Country and Field clubs and of the Pittsburgh Athletic association.

Francis Dayton Canfield Jr., vice president of the Fulton Iron Works, New York, died Oct. 9 at his home in Yonkers, New York, aged 55.

Daniel G. Trench died Oct. 8 at his home in Oak Park, Chicago, aged 54 years, following an operation for appendicitis. He was president of the Sprague Canning Machinery Co.

Herbert E. Goodman, vice president of the Goodman Mfg. Co., Chicago, died Oct. 3. He was born in Chicago in 1864 and was a pioneer in developing the electric coal mining machinery. He was the founder of the Goodman Mfg. Co. and was widely known in coal operation.

Andrew Mercer, vice president of the H. B. Smith Co., Westfield, Mass., died from heart disease recently at his home in Brooklyn. Mr. Mercer was born in Scotland 81 years ago and during the Civil war served with the ninth regiment of New York volunteers.

George E. Neil, formerly in the machine tool business in Cleveland, later salesman for Manning, Maxwell & Moore, Inc., New York, and until lately manager of the machine tool department of Fairbanks, Morse & Co., New York, was killed in an automobile accident at New Rochelle, N. Y., recently.

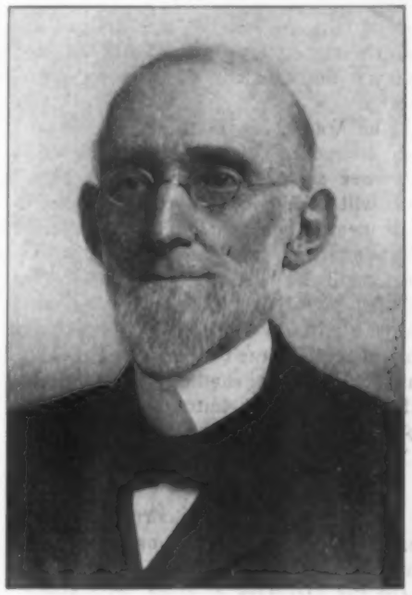
William Henry Haley, long one of the leading factors in the iron and heavy hardware trade in Boston, died at his home in Cambridge, Mass., Oct. 4, aged 79 years. He was president of the Dodge-Haley Co., Boston, with which and its predecessors he was connected for a period of 64 years.

Theodore Starrett, founder of the Thompson-Starrett Co., New York, died Oct. 9 at his home in Prospect Plain, N. Y. Mr. Starrett was born in Kansas, 53 years ago and entered the building trade at an early age. Before he was 25 he was handling contracts involving expenditures of millions of dollars. Mr. Starrett founded the Thompson-Starrett Co. 20 years ago.

Robert Weir, president of J. & R. Weir, Ltd., marine engineer, boilermaker and machinist, of Montreal, died Oct. 9, after an illness of three weeks, aged 72 years. He was born in Scotland and came to Montreal in 1871 and joined his brother, the late James C. Weir, in the marine engineering and machinist business. When the latter died, about six years ago, Robert Weir became president of the company.

To Build Zinc Mill

A 10-mill sheet zinc plant will be the outgrowth of the purchase of the building and equipment of a rolling mill at Greencastle, Ind., by D.



CRAIG RIDGWAY
Pioneer manufacturer of Eastern Pennsylvania, who died on Sept. 28.

W. Kerr, president of the Fort Smith Smelter Co., and associates. Zinc slabs will be supplied from the plant of the Fort Smith Smelter Co., Fort Smith, Ark. A new $1,000,000 corporation with $600,000 common and $400,000 preferred stock is being formed. Associated with Mr. Kerr in this project are: H. S. Buck, vice president and general manager, and F. W. Stillwagon, vice president of the Fort Smith Smelter Co. Mr. Kerr retired as vice president of the Trumbull Steel Co., Warren, O., several months ago to devote his sole attention to the Fort Smith company.

The Smiley Steel Co., Inc., New York, announces that owing to increased business it has moved its offices from 120 Broadway to larger quarters at 111 Broadway.

Trading With Enemy to be Stifled

President Appoints New War Trade Board of Six Members to Exercise Sweeping Powers Over Exports and Imports Under Trading-With-The-Enemy and Espionage Acts—Succeeds Exports Administrative Board

WASHINGTON, Oct. 16.—War trade of all kinds, including all exports and imports, now comes under the executive administration of a war trade board created Oct. 12 by the President in a proclamation made public yesterday. This new board assumes the duties of the exports administrative board but has broader powers which are given in the trading-with-the-enemy act in addition to those already in force under the espionage act. The new board may go into all transactions in which an enemy or an ally of an enemy may benefit directly or indirectly.

The war trade board, which is to be composed of six members, and to have an advisory war trade council, will take over the exports licensing system practically as organized. Headquarters, at least for the present, will be maintained at 1435 K street, Washington. Present employes will do the work of the new board and branch offices established and being established in various cities throughout the country will be taken over and operated by the new board.

Makeup of New Board

Vance McCormick, chairman of the exports board, has been named chairman of the new one. He will represent the secretary of state, who along with the secretary of the treasury, the secretary of agriculture, the secretary of commerce, the food administrator and the chairman of the shipping board, will compose the war trade council. In Mr. McCormick's board will be Dr. Alonzo E. Taylor, representing Secretary Houston; Thos. D. Jones, representing Secretary Redfield; Beaver White, representing Food Administrator Hoover, and Frank C. Munson, representing Chairman Hurley of the shipping board. Secretary McAdoo's representative, to whom will be delegated the executive administration regulating the transfer between the United States and foreign countries of coin currency, bullion, credits and securities, has not been appointed.

Powers governing exports have already been given in presidential proclamation under the espionage act and just what articles have been prohibited or regulated under them have been more or less covered in the proclamations or in explanation made from time to time by the exports board. Nothing has been issued regulating imports but under the trading-with-the-enemy act proclamations may be issued regulating all importation or imposing conditions upon which articles may be imported.

Army Will Place Many More Motor Trucks

Bids shortly are to be asked for 15,000 army motor trucks of the new standard type recently adopted by the war department. It is probable that these will be asked by the depot quartermaster at Washington. No date yet has been fixed. Bids will be asked for the truck bodies and for parts. Of class B type, 3-ton, 10,000, and class A, 1½-ton, 5000 will be ordered.

Bids were received at the bureau of standards, Washington, Oct. 20 for an experimental sheet rolling mill.

Bids have been asked by the bureau of supplies and accounts of the navy department on 150,000 feet of cast iron pipe for Norfolk; for 1600 feet of cast iron pipe for Puget Sound; for 18,150 feet of cast iron soil pipe for various navy yards; and on one tank car of 8000 gallons capacity and four general service gondolas for Charleston. Bids also are wanted on 14,300 pounds of ferromanganese for Mare Island; on 140,000 pounds of ferromanganese for Boston, Brooklyn and Philadelphia, and on 20,000 pounds of ferrosilicon for Boston.

Licenses Must Be Obtained

To trade with an enemy, licenses must be obtained from the war trade board. This covers payment of any debt or obligation that may benefit an enemy or an ally of an enemy; the negotiation of an instrument in which one of the parties directly or indirectly may be an enemy; or the making, conveying or completion of any contract or agreement which is prohibited except under license. Nor can any deal for any form of property be made or carried out, nor may any form of business or commercial communication be carried on without permission of the board.

The proclamation creating the war trade board prohibits the sending or receiving of any form of communication except under license granted by a censorship board which the President named as composed of representatives of the postmaster general, of the secretary of war, of the secretary of the navy, of the war trade board, and of the chairman of the committee on public information. The postmaster general is given power to regulate the foreign language press and the state department is given power to regulate the transporting of an enemy. Collectors of customs are given power to refuse clearance to ships which are transporting cargo in violation of the provisions of the act.

The President later will name an alien property custodian who will take charge of all property and transactions affecting the property in the United States belonging to an enemy or an ally of an enemy. Only under license can any firm having an enemy as a member at the beginning of the war change the name of the firm.

Severe penalties are provided for all violations under the act.

Exports License System Cuts August Total

Washington, Oct. 16.—The total value of exports from the United States in August, the second month of the operation of the exports license bureau, showed an increase over July but a decided decline from August, 1916. The first eight months of 1917, however, showed an increase over the same period in 1916. Imports for August were much larger than in July and very much greater than in August a year ago.

At the bureau of foreign and domestic commerce, where the figures were given out, the decline in exports is said to be due to the licensing system which prevented many finished and raw materials from reaching any country likely to aid Germany or likely to drain the United States of articles needed here. That the licensing hit hardest manufactured articles is shown in the report by a decrease of more than $85,000,000 from the total of

$274,000,000 in August, 1916. Raw materials, semifinished products and nearly all other general classifications showed an increase.

Exports in August had a total value of $490,009,171, as against $373,002,887 in July and compared with $510,167,438 a year ago. This figure made the total for the eight months $4,151,615,611, which compares with $3,435,501,945 last year. The total of imports in August was $267,854,767 compared with $225,926,352 in July and as against $199,316,480 in August, 1916. The total for the eight months was $2,046,579,605 as against $1,667,136,054 in the same period of 1916.

The value of manufactured imports also fell off from August a year ago, declining from $32,628,991 to $31,901,723, but the value of imported raw materials jumped approximately $82,000,000 to more than $118,000,000.

Early Relief Promised In Acute Coal Situation

Washington, Oct. 16.—Relief in the shortage of coal for all industries, railroads and public utilities, is promised by the fuel administration. The first attempt to bring about real relief came last week in Administrator Garfield's order to 700 mines to pro rate the requirements of the Pennsylvania railroad. Other consumers will be given their immediate needs as rapidly as the administration can get to it, it is declared.

There is a great demand, almost universally, for coal and according to Dr. Garfield these demands soon will be met. Estimates by the geological survey show that in the first eight months of 1917 the output of soft coal was 363,500,000 tons or 37,000,000 tons more than in the same period in 1916. The bureau of mines however urges the greatest economy on the part of all users of coal, the director, Van H. Manning, declaring that 10 per cent could be saved. His warning is directed particularly to users of coal for house heating.

Dr. Garfield has assigned F. C. Baird, commissioner of the Lake Erie Coal Exchange to direct the shipment of all coal moving from Lake Erie ports, having in view in addition to the needs of the northwest those of northwestern Canada.

Operators may get some relief from presidential action which may come from their costs data submitted to Dr. Garfield. If increases in the cost at the mines are allowed, it is expected they will approximate the Peabody schedule.

Eyes of the coal world will turn to Pittsburgh Oct. 23 when the National Coal association meets in what it is regarded will be a historic gathering, and to Chicago Oct. 24-25, when the National Coal Jobbers' association will meet. The operators' meeting which is regarded as so important, may bring forth some vital points in the coal situation which, despite apparent optimism, is very acute.

Plans to Barge Pig Iron From Southern Stacks

Washington, Oct. 16.—The Keystone Steel & Wire Co., Peoria, Ill., has decided to build two powerful steel towboats and 14 steel barges to carry future shipments of pig iron by water from the Alabama district to its plant at Peoria. Decision to build these carriers came after two shipments of 12,000 tons each of pig iron were made successfully over the Mississippi-Illinois river route. This is disclosed in a letter from Charles U. Freund, consulting engineer of the Keystone company, to Sidney J. Roy, secretary of the Mississippi Valley Waterways association. Mr. Roy says this is the greatest step toward development of inland waterways since announcement by the American Aluminum Co., East St. Louis, Ill., that it would spend nearly $4,000,000 to build barges to transport bauxite from its mines in Arkansas to East St. Louis.

Further steps looking to the development of inland waterways which may call for more steel barges by other companies, may be taken at the fourteenth annual convention of the National Rivers and Harbors congress to be held here Dec. 5-7. This convention has been called by Senator Ransdell, president of the congress, and will be addressed by Secretary Baker, Secretary Daniels, Secretary Redfield, Brig. Gen. William M. Black, chief of engineers, Senator Hiram W. Johnson, Senator Fletcher, chairman of the senate commerce committee, Representative Small, chairman of the house committee on rivers and harbors, and Walter Parker, secretary of the New Orleans Association of Commerce and especial investigator on the question for Secretary Redfield. More definite announcement of the progress will be made later.

Commandeers All Ships of More Than 2,500 Tons

Washington, Oct. 16.—All ships of American registry and of more than 2500 tons deadweight or gross register were commandeered by the shipping board yesterday. This was done in accord wth a plan announced some time ago and affects, according to the board's estimates, 458 vessels. The board is considering taking over all ships having a minimum deadweight capacity of 1500 tons. Just how many more this would add to the total has not been disclosed.

The sweeping order became effective immediately upon all American ships in American ports. American vessels in foreign ports and those bound either to or from this country will be formally affected by the order immediately upon their home arrival. Those ships of American registry sailing only between foreign ports shall be commandeered as of yesterday. Owners are to continue operating in their regular trade until they receive instructions from the government. These operations, however, will be for the account of the government. Where ships are chartered the owners will apply to the shipping board for instructions regarding the further employment of the steamers. The charter rates allowed by the government as formerly announced will be put into effect.

All sides are clamoring for vessels and this presents one of the greatest problems confronting the shipping board. More than 1,000,000 tons of war supplies, particularly steel, are said to be lying in American ports awaiting vessels to carry it to France. But the difficulty of the shipping board may be seen in the fact that now it takes a vessel seven weeks to make a round trip to France where formerly it took but four. This is due to the lack of facilities of unloading in French ports and to the absolute necessity of convoying the freighters, as well as passenger and transport ships, for which there is apparently a lack of war vessels. Destroyers now being built will greatly relieve this situation. All the congestion in American ports is not the result of lack of shipping facilities, but partly is due to the red tape involved in licensing exports. The commissioning shortly of the interned German and Austrian vessels seized by the United States upon the declaration of war, is expected to give relief to shipping requirements.

Secretary McAdoo who recently reduced the insurance rates from 6½ per cent to 5 per cent on vessels and cargoes traversing the war zone, last week announced a reduction also in seamen's insurance on these same steamers.

Completion of the machine shop of the Liberty Steel Co., Warren, O., has been effected and rapid progress is being made on the structural work of the other buildings. President Edward F. Clark states that work will commence on the installation of the mill equipment about Jan. 1.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

CHARLES W. JOHNSON, who was elected vice president of the American Institute of Metals at its recent meeting, is general superintendent of the East Pittsburgh works of the Westinghouse Electric & Mfg. Co. Mr. Johnson is a native of Ohio and a graduate of Ohio State university. He began his business career after graduation as draftsman with the Steel Motor Co. of Johnstown, Pa., after which he became connected with the Bulloch Electric Co. of Cincinnati in 1897, successively holding the positions of chief draftsman, engineer, and production manager. From 1904 to 1907 Mr. Johnson was superintendent of the combined Allis-Chalmers and Bulloch plants at Montreal, Canada. In the latter year he entered the employ of the Westinghouse Electric & Mfg. Co. as chief inspector. In 1909 he was promoted to the position of assistant manager of works, which position he continued to fill until 1912, when he was made general superintendent of works.

P. J. Kroll, for some time representative of the International Oxygen Co. in Pittsburgh and middle western territory, has resigned.

E. S. Christiansen has opened offices in the Dime Bank building, as Detroit representative of the United Smelting & Aluminum Co., Inc.

J. L. Murray, son-in-law of M. J. O'Brien, who holds a controlling interest in the Renfrew Machinery Co. of Renfrew, Ont., has been elected president of the company.

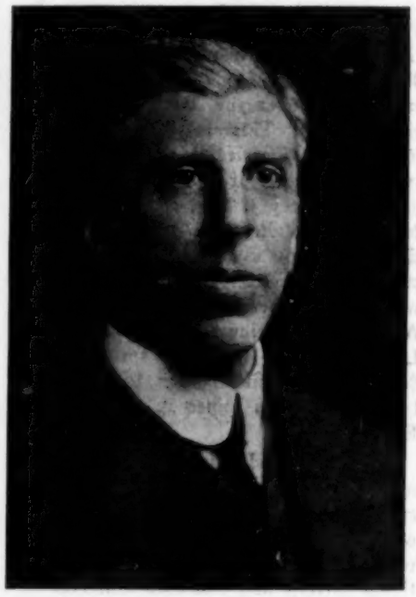
Fayette H. Reed has been appointed special agent of the Acar Mfg. Co., New York, having oversight of seven coast states, with offices at San Francisco.

B. F. Devine, who is assistant manager of the mixer department of the Chain Belt Co., Milwaukee, also has been made assistant advertising manager of the company.

William C. Bennett has been named superintendent of machinery of the Kelley-Atkinson Shipbuilding Corp., Chicago, Ill., and Mobile, Ala. The company is building a plant at the latter place.

John L. Foote Jr., who has been connected with the offices of the Republic Iron & Steel Co. at Negaunee, Mich., for several years, has been named private secretary to F. J. Webb, general manager.

C. F. Goodrich, assistant manager of the Boston office of the Buffalo Forge Co., has been commissioned a first lieutenant in the ordnance department and now is stationed at the Watervliet arsenal.



CHARLES W. JOHNSON

Charles C. Cheyney, manager of the Chicago office and store of the Buffalo Forge Co., who now holds a commission in the naval aeronautic corps, has been appointed beach engineer in charge of airplane engines at Pensacola, Fla.

H. F. Bardwell has been appointed manager of the New York district for the Vanadium-Alloys Steel Co. of Pittsburgh and Latrobe, Pa. Mr. Bardwell will have charge of the company's New York offices, which are located at 30 Church street.

B. Botsford Peters, who for the past nine years has been manager of the Providence, R. I., agency of the Palmer Bros. Engine Co., has been promoted to take charge of the Philadelphia agency. He is succeeded by D. W. Johnson.

Richard G. Williams, sales engineer for the Norton Co., has received a captain's commission in the army which will attach him to the production section of the gun division in the office of the chief of ordnance in Washington.

Ole K. Olsen 822 Perdido street, New Orleans, has been named sales agent for the Asbestos Protected Metal Co., Pittsburgh. Mr. Olsen will have charge of sales work in Louisiana and the southern portion of Mississippi.

John J. Harty has been named president of the Canadian Locomotive Co. Mr. Harty previously was vice president and general manager of the same company. He also is a director of the Dominion Foundries & Steel Co.

Don R. Marsh, who for some time has been associated with the Buffalo Forge Co., Buffalo, as production manager, has given up his duties with the company to take a similar position at Washington in the ordnance department. Mr. Marsh will receive a captain's commission.

William B. Osborne, a construction engineer for the Riter-Conley Co., Pittsburgh, who has been engineer of the Lowell Gas Light Co., Lowell, Mass., the past two years, has been elected president and general manager of the Worcester Gas Light Co., Worcester, Mass.

W. E. Boger, recently resigned as superintendent of shipping and transportation at the Gary, Ind., plant of the Illinois Steel Co., to accept a position as manager of the steel and hardware department of W. F. Burns Export Corp., 25 Pine street, New York City.

T. H. Letson, for 17 years New York sales manager of the American Hoist & Derrick Co., has formed a partnership with Frederic Glanden, electrical and mechanical engineer, to engage in the sale of hoisting and power machinery. Offices have been opened at 50 Church street, New York.

Charles O. Rowe, who for six years has been associated with the steel department of the Union Drawn Steel Co., Beaver Falls, Pa., has joined the sales force of the Hess Steel Corp., Baltimore. In his new

position with the Hess Steel Corp. he will act as sales representative in the Philadelphia district.

Schuyler Merritt, vice president of the Yale & Towne Mfg. Co., Stamford, Conn., and also identified with the American Tube & Stamping Co., Bridgeport, Conn., is a candidate for congress in the fourth Connecticut district to fill the vacancy caused by the death of Representative Ebenezer J. Hill.

A. W. Hubbard, who for 26 years has been assistant to the president of the Andrews Steel Co. and the Newport Rolling Mills, both of Newport, Ky., has been chosen president and general manager of the Charleston Alloy Steel Co., Belle, W. Va. P. D. Mackey has been named general superintendent of the Charleston company to succeed Charles A. Swan, who resigned a short time ago.

Warren W. Baker, president, and Francis S. Carr, vice president, of the Pennsylvania Steel Export Co., Finance building, Philadelphia, left Oct. 5 for Japan, where they propose to establish a branch office. Mr. Baker is expected to return in January while Mr. Carr will remain to get the Japanese office under way. The headquarters of the company shortly are to be removed to the Widener building, Philadelphia.

C. P. Burgess has resigned as general manager of the St. Louis Screw Co., St. Louis, to become director of operations for the Pacific Coast Steel Co., with headquarters in the Rialto building, San Francisco. The Pacific Coast Steel Co. operates plants at San Francisco, Portland and Seattle. Prior to his affiliation with the St. Louis Screw Co. in 1913, Mr. Burgess was district superintendent in charge of operations for the Republic Iron & Steel Co., with headquarters at Chicago. He is one of the most experienced and widely known bar iron mill operators in the country. The plant of the St. Louis Screw Co. was built under his supervision. Mr. Burgess is succeeded in St. Louis by J. P. English, general superintendent, and G. A. Gunther, office manager.

To Have Cuban Exhibit

In order to take care of its growing business in Cuba, the Vulcan Steel Products Co. has opened an office in Havana, under the management of G. O. Simpson. In connection with this office there will be maintained a permanent exhibition of machinery and steel and iron products, in which the company deals. The Vulcan Steel Products Co. now is maintaining branch offices at Paris, Hongkong and Shanghai, Yokahama, Milan, Barcelona, Melbourne and Sydney, San Juan, Singapore and Havana. The company also is represented by well-known business houses in a number of the leading trade centers.

War Co-operation

With Government is Discussed by Association of Purchasing Agents

Attended by about 400 delegates, the National Association of Purchasing Agents held its annual convention in Pittsburgh Oct. 9 to 11, inclusive. The interest of the convention was heightened by reason of the presence of government agents, and part of the discussion related to co-operation with the nation to assist it in purchasing supplies. E. L. McGrew, Pittsburgh, who was re-elected as president, conducted the sessions and told the convention that the association was at the nation's service. W. L. Chandler, of the Dodge Mfg. Co., Mishawaka, Wis., spoke on "Standardization of Catalogs"; W. L. Langford, the Westinghouse, Church, Kerr & Co., on "Policy in Buying"; F. A. Marsh, the Link Belt Co., Chicago, on "Cash Discounts as Viewed by the Purchasing Agents"; N. O. Aeby, Columbus, O., "Co-operation Between the Salesmen and the Purchasing Agents"; Dixon C. Williams, Chicago, on "The Ideal Purchasing Agent", and James Francis Burke, on "America's Responsibility". Dr. John A. Brashear told of Pittsburgh's contribution to science and art.

Mr. Aeby advised the delegates "in time of war prepare for peace". He pointed out the advantages of co-operation between the purchasing agent and the salesman. Initial steps to organize an exchange bureau, employment bureau and a credit bureau and the standardization of catalogs were taken up, and President McGrew authorized to name committees to undertake the work. Mr. Williams described a real purchasing agent as one of the most important cogs in the world of commerce, with comment on the world situation brought about by the war in Europe. In addition to re-electing President McGrew, the association chose the following officers: First vice president, N. O. Aeby, Columbus, O.; second vice president, Charles P. Kingston, Detroit; third vice president, William P. Golder, Philadelphia; secretary, T. F. Boffey, New York City, re-elected; treasurer, W. T. Hall.

The Pioneer Brass Works, Indianapolis, has increased its capital from $10,000 to $70,000.

Tin Plate Output

In 1918 Will Be Greatly Enlarged, But Demand is Tremendous

Coke tin plate production in the United States for 1918 will be 36,450,000 base boxes, according to estimates by the tin plate conservation committee of the government. The official figures of coke tin plate production of the country for the calendar year of 1916, which are the last available, show 24,946,483 base boxes were produced. It is pointed out by the committee that the widespread demand for tin plate from all parts of the earth not only has attracted more capital to the industry and has resulted in the erection of new mills, but also has led the existing plants to tin a much greater proportion of their black plate production than ordinarily. The estimated hot mill production for 1918 is placed at 38,700,000 base boxes. Total shipments of coke tin plate for the first eight months of 1917 were 22,843,779 base boxes. Of these, 12,750,350 boxes were used for food containers in this country and 587,372 boxes for Canada; 924,316 boxes went into oil cans in this country and 591,951 boxes in foreign countries; 721,443 boxes were used for tobacco containers; 644,522 boxes for bottle caps and stoppers, and 1,030,019 boxes were shipped to jobbers. The total foreign shipments for the first eight months of 1917 were 1,080,332 boxes to Canada, and 1,448,001 boxes to other countries. The mill obligations as of Sept. 1, 1917, were 7,186,577 boxes for food containers, and 8,433,183 boxes for other purposes.

The committee states unless greatly increased shipments are made to the oil, tobacco and bottle cap manufacturers during the last quarter, the consumption this year will be approximately 1,000,000 base boxes each for tobacco and bottle caps, and 2,000,000 boxes for oil. While this is probably as much as was used in the same industries last year, it falls far short of meeting this year's requirements.

The Lewis Electric Welding & Mfg. Co., Toledo, O., recently chartered with a capital of $100,000, has taken over the business of the Lewis Foundry Co. and will make enlargements. A new building, 36 x 120 feet, has been completed, and a building, 36 x 100 feet, is under way. Some new equipment is to be installed. The company is specializing in the production of semisteel cast head valves for gas, gasoline and oil engines. Upon the completion of the extensions under way it will be able to double its present output.

Watching American Price Control

British Iron and Steel Industry Greatly Interested in Recent Regulatory Measures Taken by United States Government But Does Not Anticipate Immediate Increase in Imports— British Sheet Control Causes Dismay to Makers

Bureau of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., Sept. 29.

BRITISH steel makers are much interested in the drastic control of steel prices and production undertaken by the American government, news of which has been conveyed by the cables of THE IRON TRADE REVIEW. It is scarcely hoped, however, that this means for the present larger consignments of tonnage to this country. Indeed all British arrangements for the future contemplate the necessity of being self-sufficient in the matter of steel supplies. A few imports still are coming from America but they are restricted almost wholly to wire rods, hollow blooms for tubes, and to similar specialties. It is almost impossible to buy American billets. There is, however, a steady increase in the British output of half-finished steel.

A great amount of interest is concentrated on the government control of the sheet business. The ministry of munitions has decreed that prices shall be restricted £17 ($81.60) maximum for black doubles. This is to be a net price at makers' works. The price announcement has caused a certain amount of dismay since makers have had no difficulty whatever in selling their sheets for the last year at £19 10s ($93.60) less 4 per cent delivered. A strong effort is to have the ministry modify its order. The severe cut is very hard on the sheet makers because of their reduced output, due to the scarcity of raw steel and spelter. A meeting of manufacturers was held in Birmingham this week and a deputation was appointed to interview the authorities.

Small Lots at Large Figure

The £17 ($81.60) maximum now is in operation and is applying to lots of two tons and upwards. Smaller sales may be made at £19 ($91.20). Apparently, the idea is to discourage small transactions. This is a severe blow to the sheet trade which under war conditions has hardly been profitable for some time. It is a common report from producers that they are operating at only one-third capacity. For galvanized corrugated sheets the price is a little more liberal, being £28 ($136.40) net at makers' works.

There is a steady increase in the volume of iron and steel business, compelling all makers to organize, to reorganize, and to strain every nerve to increase production. An interesting sequel to this expansion is a demand from the Barrow trades and labor council that the government erect 2000 workmen's houses in Barrow. This increase of employment there is directly attributable to the growth in the steel trade. It is officially announced that the government contemplate the building of 200,000 subsidized workmen's cottages.

There is no diminution in the flow of finished steel orders from the government. All the South Staffordshire works are making full production with enough business in reserve to keep them fully occupied until the end of the year. Galvanized sheets and tinplates are selling in only small quantities, chiefly because of the scarcity of raw material. The tinplate trade of South Wales is making shipments far in excess of production so that the small stocks are depleting. Manufacturers report their order books full for some months ahead so that they are unwilling to undertake further commitments.

For the time being, the Midlands appear to be the center of activity in pig iron. Makers from Staffordshire, Northamptonshire, Derbyshire report themselves enormously pressed for supplies, and supplies are insufficient to go round. It is the rule now to cut down all orders to a fraction of the quantities asked for. Foundry iron, in particular, is the subject of the keenest inquiry. Consumers stocks are running very low, and buyers are anxious for renewal. Many of the furnaces are several weeks in arrears with their orders, which is serious since all this iron is wanted for war purposes. The heavy foundries in the Birmingham district are meeting with an enormous demand for big mill machinery from Scotland, Yorkshire, and Wales, so that all the cold blast iron available is promptly used up. A very large consumption of iron is called for for heavy shipbuilding machinery. The supply of basic continues to increase, as more furnaces are brought into operation on this grade. In the Middlesbrough district, conditions are quieter. Apparently, a satisfactory balance between production and consumption has been secured in that district, and deliveries are being regularly made to home consumers assisted by a somewhat better supply of trucks. Very little export trade is in progress there, and a sharp eye is kept on all shipments to neutrals. Scotch iron apparently becomes scarcer while consumption tends to increase. An improvement is reported in the shipments of Swedish iron. Prices keep abnormally high even from the war standpoint. East coast hematite continues extremely scarce. Quotations are at the official maximum both for export and home consumption. The fuel question causes concern.

How War Increased Output

Some most interesting information relative to the effect of war upon production was given by Lord Aberconway when presiding at the meeting of John Brown & Co., at Sheffield, Sept. 27. Lord Aberconway stated that in shipbuilding alone the company's capacity had been trebled. The output of the company in war supplies was perfectly amazing, compared to that of a few years ago. The works constituted a great national arsenal. The man power in production of the nation as a whole, said his lordship, had increased 30 per cent over normal, but with 30 per cent less male population. That would have been impossible without the valuable help of women. The country was producing within 10 per cent of its pre-war standard, in coal, although tens of thousands of miners had gone to the front. In pig iron in spite of the depletion of men the output was normal while in steel the output was 20 per cent more than before the war. The company is preparing for a very large steel and shipbuilding output in the future, which he thought would be almost the dominant trade in years to come.

Valve Maker Increases

Reconstruction of its manufacturing plant and office buildings has been effected by the Homestead Valve Mfg. Co., Pittsburgh, whereby about 75 per cent of additional floor space has been added. New machinery and equipment also has been added, so that the company has been able to double its former rate of production. The product of the Homestead Valve company has found a wide use in plants used for manufacturing powder and munitions, as well as for various purposes in government work.

Metal Exports Again Swing Upward

Total Shipments in August Make Gain of Approximately 150,000 Gross Tons Over Preceding Month—Tonnage, However, Still is Under That of Last Year —Pig Iron Exports Almost Doubled

A SHARP recovery in iron and steel exports from the drop in July, which followed the preceding month of record shipments, took place in August, according to the complete figures just issued by the bureau of foreign and domestic commerce. Shipments of pig iron in August were almost double those for July, but show only a slight increase over the August, 1916, figures. There were 60,489 tons of pig iron exported in August, 1917, 32,368 tons in July, 1917, and 60,262 tons in August, 1916. The total tonnage of semifinished material exported in August was the largest since March, 189,083 tons having been sent to foreign countries in August, 1917, as against 112,085 tons in July, 1917, and 160,921 tons in August of last year. Exports of sheets, plates, steel rails and steel bars also made notable gains.

IRON ORE IMPORTS, GROSS TONS

	—July—		Seven months ending July,	
	1917	1916	1917	1916
Spain	.....	17,517	133,906	96,799
Sweden	6,358	21,213	52,355	131,663
Canada	18,418	52,949	56,087	115,454
Cuba	48,150	54,175	278,863	388,151
Oth. countries	16,803	10,901	28,747	60,695
Total	89,729	156,755	549,958	792,762

EXPORTS, GROSS TONS.

1916	Pig iron	Semi-finished material
Jan.	18,719	55,315
Feb.	15,061	87,306
Mar.	19,439	107,696
Apr.	18,518	88,764
May	28,293	142,782
June	48,770	116,425
July	28,718	135,827
Aug.	60,264	160,921
Sep.	64,122	163,104
Oct.	101,756	162,679
Nov.	102,786	125,038
Dec.	105,195	162,901
1917		
Jan.	69,146	183,656
Feb.	49,018	131,566
Mar.	69,629	193,469
Apr.	44,783	174,039
May	61,112	168,158
June	48,770	116,316
July	32,368	112,085
Aug.	60,489	189,083

Although the total exports of iron and steel products for August, 519,518 tons, were almost 150,000 gross tons above the July total of 357,776 tons, they did not reach the total for August, 1916, which was 571,401 tons. It is somewhat difficult to account definitely for the upward swing in August, but it may be due in part to better handling of export licenses, and a more settled state generally of export conditions. For the first eight months of 1917, the iron and steel products shipped from this country amounted to 4,271,331 tons, which is a gain of over 570,000 tons compared with a similar period for 1916, the total for the first eight months being 3,694,060 tons.

The value of exports of iron and steel and manufactures thereof amounted to $90,351,388 in August of this year. This compares with $85,736,585 for the month previous and $77,782,294 for August, 1916. For the eight-month period ending with August, 1917, exports of these products were valued at $803,776,580, a considerable increase over the first eight months of 1916, in which period the total value of shipments of iron and steel products amounted to $530,287,025.

IRON AND STEEL EXPORTS, GROSS TONS

	August		Eight months ending August	
	1917.	1916.	1917.	1916.
Scrap	6,761	18,149	134,784	121,833
Pig iron	60,489	60,264	468,544	238,382
Steel billets, Ing. and blooms	189,083	160,921	1,329,708	895,005
Wire rods	20,621	11,450	99,678	107,695
Steel rails	24,698	41,820	338,592	304,773
Steel bars	48,809	52,551	423,193	525,031
Iron bars	2,306	5,207	36,462	52,226
Struc. iron and steel	19,418	27,581	201,312	182,533
Hoops, b'ds and scroll	4,685	3,649	36,615	28,695
Sheets, plates	74,936	47,822	546,456	326,374
Tin and terne plate	15,962	18,757	161,099	160,354
Barbed wire	5,817	46,842	109,912	299,509
All oth. wire	12,138	26,514	129,056	186,646
Cut nails	480	278	2,416	2,786
Wire nails	10,551	14,809	64,442	99,339
All oth. nails, incl. tacks	875	1,160	13,025	6,039
Pipes & fit'gs	16,636	28,801	133,466	135,885
R. R. spikes	843	1,367	12,809	18,561
Bolts, nuts, rivets & was'r's	2,728	2,653	20,283	19,356
Horseshoes	1,494	372	3,113	6,193
Cast radiators	188	434	4,017	1,633
Total	519,518	571,401	4,268,982	3,718,848

The steady decrease in imports, which has been noted for some time past, continued in August. The total tonnage of iron and steel products shipped to this country in August, 1917, amounted to 22,635 tons, compared with 28,859 tons in July, 1917, and 23,255 tons in August, 1916. There has been very little change in the tonnage of imports since last May.

A most marked decrease, however, is shown in the shipments of iron ore to this country. Only 63,571 tons of iron ore were shipped to the United States in August, 1917. In the previous month, 89,729 tons of iron ore were imported, while in August, 1916, the imports amounted to 127,094 tons. Shipments of iron and steel products during the first few months of the year, however, were greater than those for the corresponding months of 1916, and for that reason the total for the eight months ending with August, 1917,

IRON AND STEEL IMPORTS, GROSS TONS

	July,		Seven months ending July,	
	1917	1916	1917	1916
Scrap	13,107	4,615	150,576	34,289
Pig iron	5,672	6,434	49,319	67,179
Steel ingots, blooms and billets	6,974	1,348	24,538	17,038
Wire rods	168	495	193	2,566
Rails	579	546	4,321	16,520
Bar iron	968	987	1,503	4,840
Structural	1,128	7	1,682	1,012
Sheets and plates	263	192	1,100	1,094
Tin and terne plate	.....	150	124	671
Total	28,859	14,774	233,356	145,209

is considerably greater than the total for the same period in 1916. The first eight months of 1917 show imports amounting to 225,989 tons, while in the first eight months of 1916, only 168,461 tons of iron and steel products were shipped into this country. The falling off in imports of this commodity are more noticeable in a comparison of the eight-month period. For the eight months ending with August, 1917, the tonnage amounted to only 613,529, while for the first eight months of 1916, the tonnage was 919,856.

IMPORTS AND EXPORTS, GROSS TONS.

1915	Imports	Exports
July	20,858	380,340
August	27,556	405,850
September	23,345	382,113
October	34,318	349,843
November	37,131	362,764
December	35,408	353,853
1916		
January	15,824	360,102
February	20,279	368,980
March	15,159	438,649
April	20,176	384,452
May	32,114	540,580
June	26,885	515,214
July	14,774	502,330
August	23,255	571,401
September	25,559	643,762
October	30,169	610,110
November	42,545	554,856
December	44,134	580,957
1917		
January	40,192	608,105
February	24,379	449,099
March	37,280	606,559
April	48,213	519,397
May	26,013	588,514
June	28,419	614,600
July	28,859	357,776
August	22,635	519,518

The Western Gas Engine Corp., of Los Angeles, has changed its name to the Western Machinery Co.

Iron and Steel Financial News

Up-to-the-Minute Fact and Comment Collected and Sifted for Busy Readers

Big Slump In Stock Prices Is Puzzle

WHAT is the matter with the stock market? Why are stocks dropping so rapidly? This is the question that Wall street and the financial country at large are trying to answer; to date no single answer has received widespread concurrence. All classes of securities have suffered sharp depreciation. Railroad shares are down to the lowest average since the panic of 1907. Industrials are down 20 to 30 points from their high prices of earlier in the year. Standard stocks can be bought which will return their holder a yield of anywhere from 6 to almost 10 per cent, while earnings are running from three to four times present dividend requirements, yet the liquidation of previous weeks gained momentum last week. Following is a list of the common stocks some of the leading steel producing companies, listed on the New York stock exchange, showing the closing price Oct. 11, and the high price for the year recorded by these various stocks:

	Closing price Oct. 11.	High price for year.
Bethlehem Steel, B.....	76½	155½
Colorado F. & I.....	38½	58
Crucible Steel	66⅛	91⅞
Gulf States Steel.....	90¼	137
Lackawanna Steel	78	103⅞
Republic I. & S.....	75⅞	94½
Sloss-Sheffield	39	74¼
Midvale Steel	44¾	67½
U. S. Steel	102⅞	136⅝

The suggestion that price fixing might be a factor in the decline of steel stocks is set aside by most observers, as the prices established are considered high enough to assure a substantial profit to the companies listed. Besides, the price fixing factor would not apply to the railway shares, which likewise have dropped sharply. Excess profits taxing likewise is disregarded as being a factor, for financiers say that the taxes, while heavy, will leave most companies ample margin over dividend requirements. Is it the prospect of peace, such as caused previous breaks in stocks? Wall street says not, and insists that prospects of peace would result in vigorous buying of stocks. Some people are of the belief that investors are selling their old holdings to obtain funds for the second Liberty loan. But experienced financial critics shake their heads and say that such preparation was completed some time since. Some are of the opinion that reports of a demand for higher wages on the part of the railway trainmen are the cause for the stock market's movement. But this theory will be dismissed quickly when one stops to think that this is 1917, not 1916, when conditions were entirely different.

Probably a composite of all these reasons and a few more added might explain the drop in stocks. This country is at war. A large part of its labor, its money, its efforts are to be expended in war preparation. Industry had reached its maximum activity and was nearing its maximum earning power when the United States entered the war, opening an entirely new economic chapter, and now the stock market is performing its normal function of interpreting general business conditions. But when one notes the places to which the steel stocks have fallen he is apt to think that the stock market may be following certain other precedents and swinging further than necessary.

Propose New Contract for Export Business

New York, Oct. 16.—Exporters are studying a new form of export contract which has been drawn up by the representatives of eight of the largest American export and shipping interests at Sao Paulo, Brazil, the largest center of American trade in South America. The men who drew up the contract have agreed to print it in future on the back of every letter confirming any c.i.f. sale which they make, and to include on the face of the letter a clause which binds both parties to the agreement on the back.

"The buyer," this clause reads, "declares that he has read the seven clauses written on the back of this letter, which he accepts as to all intents and purposes an integral part of this document." The seven clauses of the contract provide a number of departures from existing practice. The first announces that "the responsibility of the shipper as regards delivery ceases once the merchandise is embarked", as it is then "on the account and at the risk of the buyer, and the shipper does not assume any responsibility for the arrival, nor for any damage".

The third clause also expressly excepts the shipper from responsibility in case of "strike, floods, fires, accidents, disasters, delays and other difficulties in land or marine transportation, and for other causes independent of the will of the shipper". Moreover, under clause 4, "in time of war the shipper will insure the merchandise against all war risk and without the necessity of consulting the buyer, the cost of this insurance being for the account of the latter".

None of the big firms as yet, so far as known, have given their approval to this new form of contract submitted to their representatives.

American Shipbuilding Co. Building Many Boats

Ships having an aggregate carrying capacity of 161,000 gross tons were completed and delivered by the American Shipbuilding Co., during the current fiscal year. The company now has 43 ships with a carrying capacity of 160,000 gross tons under contract. These facts were presented to stockholders, in the annual report of M. E. Farr, president. While the net earnings of the company were satisfactory, they did not represent the maximum earning capacity of the company, owing to the scarcity of labor, weather conditions, embargoes and other contingencies. Appropriations for additional buildings and other improvements during the year aggregated $1,063,000. During the current business year the company sold its stock holdings in the Western Drydock & Shipbuilding Co., Port Huron,

Ont., at a net advance of $242,000, and disposed of its holdings in the Great Lakes and St. Lawrence Transportation Co., at a net advance of $262,500. At the present time there are no incumbrances on any of the properties of the company and no known contingent liabilities. No changes in the personnel of the directorate were made excepting the election of R. G. Hutchings Jr., to succeed the late James H. Hoyt. The directors chose officers as follows: President, M. E. Farr; vice president, James E. Davidson; second vice president and secretary, O. J. Fish; treasurer and assistant secretary, John S. Gorman; assistant treasurer, H. F. Pankhurst; auditor, J. A. Lozier; operating manager, A. G. Smith.

Foreign Holders of Steel Unwilling to Sell

Foreign holdings of common stock of the United States Steel Corp. were decreased by only two shares during the quarter ending Sept. 30. This compares with a loss of 17,227 shares in the second quarter, 8249 shares in the first quarter, 35,177 shares in the fourth quarter of 1916 and 87,445 shares in the third quarter of 1916. According to a compilation prepared by the Steel Corporation, foreign holdings of its common stock on Sept. 30 amounted to 477,109 shares, as compared with 477,111 shares on June 30 and 494,388 shares on March 31. Foreign holdings of the preferred stock on Sept. 30, 140,039 shares, compared with 142,286 on June 30 and 151,757 on March 31.

Holdings of common and preferred stock in some of the principal foreign countries on Sept. 30, as compared with June 30 and March 31, were as follows:

COMMON STOCK

	Sept. 30	June 30	March 31
England	174,213	176,307	188,146
Holland	229,185	229,195	231,475
France	29,866	29,982	30,420
Canada	33,980	36,064	33,777
Germany	628	628	628
Austria	472	472	472

PREFERRED STOCK

England	37,100	39,604	46,467
Holland	25,274	25,274	25,284
France	25,829	26,327	26,963
Canada	35,685	35,962	35,876
Germany	935	935	935
Austria	3,683	3,683	3,683

An interesting feature of the Steel Corporation's compilation is the large holdings of steel stocks in Holland which remain in the hands of brokers in that country. These interests Sept. 30 held 228,610 shares of common and 23,910 shares of preferred, while investors in that country had only 585 shares of common and 1364 shares of preferred. The figures show no change in Dutch holdings June 30, but a slight decline from March 31 when the brokers held 231,164 shares of common and 23,920 shares of preferred. Investors' holdings were unchanged. Foreign and domestic holdings of the Steel Corporation's common stock in the hands of brokers Sept. 30 amounted to 2,676,917 shares, or 52.66 per cent of the total, compared with 2,803,243 shares, or 55.15 per cent, June 30, and 2,702,140 shares, or 53.16 per cent, on March 31. Investors in this and other countries owned 2,406,108 shares, or 47.34 per cent of the total, Sept. 30, 2,279,782 shares, or 44.85 per cent, June 30 and 2,380,885 shares, or 46.84 per cent, March 31.

Lackawanna Steel Keeping Up Large Earnings

Net earnings of the Lackawanna Steel Co. for the first nine months of 1917, after the deduction of all fixed charges were $18,294,532, as compared with $8,379,042 earned in the corresponding period of 1916. This surplus, which is available for dividends, is equivalent to 52.1 per cent on the company's outstanding stock of $35,095,500. During the third quarter, the report for which has just been issued, the surplus available for dividends amounted to $6,096,317, which is equivalent to 17.3 per cent of the capital stock. Comparative tables for the third quarter and the first nine months of the year follow:

	Third quarter of 1917	1916
*Total net earnings	$7,021,871	$4,045,193
Deduct:		
Bond int., Lack.	311,281	341,625
Bond int., subs.	45,575	75,412
Rentals and royals.	.....	25,359
	$6,665,015	$3,602,796
Balance:		
Exting. mines, etc.	133,133	108,198
Depreciation	435,565	433,897
Prof. for 3d quar.	$6,096,317	$3,060,700

	First nine months of 1917	1916
*Total net earnings	$21,104,516	$11,343,820
Deduct:		
Bond int. Lack.	933,866	1,112,958
Bond int., subs.	145,604	227,904
Rentals and royals.	8,542	76,177
Balance	$20,016,503	$9,926,780
Exting. mines, etc.	340,521	262,588
Depreciation	1,381,449	1,285,149
Prof. for 9 mths.	$18,294,532	$8,379,042

Unfilled tonnage of the company continues to fall off steadily. The record at the end of each quarter respectively is as follows:

	Tons
Sep. 30, 1917	791,962
June 30, 1917	913,196
Mar. 31, 1917	992,096
Feb. 12, 1917	811,126
Sep. 30, 1916	745,694
June 30, 1916	932,857

Picric Acid

To Be Substituted by Government for Trinitrotoluol in High Explosives

New York, Oct. 13.—Government officials have reached a decision that owing to the scarcity of toluol for making trinitrotoluol, substitutes will have to be relied on to a growing extent. One of the chief moves in this direction will be the use of picric acid instead of trinitrotoluol. So far, however, nothing yet has been done in the way of letting actual contracts. On the other hand, however, the government expects to take care of large additional high explosives raw material requirements through the new nitrating plant which is to be erected shortly, and for which the Stone & Webster Engineering Corp. now is taking bids.

Transaction of magnitude in the coal tar products market were lacking the past week. The most active product was phenol which has been in urgent demand for some time. A fair amount of spot business was closed and there is a large amount of open inquiry for contracts. These the makers are not anxious to accept because of the strong condition of the market. Phenol is quoted at 45 cents per pound for spot and at 43 to 45 cents for contract.

Several fair-sized spot benzol orders were placed this week. On the whole, however, this market is quiet. Pure benzol may be quoted at 49 to 53 cents per gallon for spot and contract shipment. In toluol the only business placed was a few spot carloads at around $1.75 per gallon. Solvent naphtha continues quiet, with a tendency toward weakness; it is quoted at 17 to 20 cents per gallon, both for spot and contract. Sulphate of ammonia, despite brisk inquiry, is quiet as to new business.

Coke Oven By-Products

Spot	
Per Gallon at Producers Plant	
Pure benzol	$0.49 to .53
Toluol	1.70 to 1.80
Solvent naphtha	.17 to .20
Per Pound at Producers Plant	
Phenol	$0.45
Per 100 Pounds at Seaboard	
Sulphate of ammonia	$4.90 to 5.05
Contract	
Per Gallon at Producers Plant	
Pure benzol	$0.49 to .53
Toluol	1.50 to 1.80
Solvent naphtha	.17 to .20
Per Pound at Producers Plant	
Phenol (nominal)	$0.43 to .45
Per 100 Pounds at Seaboard	
Sulphate of ammonia	nominal

Crane Builders Convene at Capital

Pressing Need of Quickened Production Emphasized at Builders' Washington Conference—Fully 300 Cranes Needed to Fill Government Requirements for First Half—Destroyer Equipment to be Given Precedence

REPRESENTATIVES of several builders of locomotive cranes, cargo ships and destroyers recently conferred with members of the Emergency Fleet corporation and various other government officials at Washington in respect to the matter of meeting government locomotive crane requirements in the next semiannual period. At the conference figures were presented showing that the new cargo ship, destroyer and navy yard needs for the first half of 1918 will be such as to necessitate the buying of 180 locomotive cranes, while those requirements occasioned by the construction of cantonments will demand 120 more cranes. Builders expect to complete this lot of 300 cranes according to schedule. The buying of equipment for new destroyers will take precedence over everything else. Many builders of electric cranes have been notified that each will receive his allotment on which work must be started immediately. The Fore River Shipbuilding Corp. will require 80 cranes of various types. The New York Shipbuilding Co. and the Bath Iron Works will make extensive improvements in order to accommodate government destroyer work. The American International Corp. is reported to have closed for all needed cranes. The Newport News Ship Building & Drydock Co. has closed for a number of wooden derricks and for several 15-ton traveling cranes. The Stone & Webster Engineering Corp. soon will take bids on three 10-ton traveling cranes. The Pittsburgh works of the Edgewater Steel Co. at Verona, Pa., has issued a list of about 50 machine tools required for ordnance work which the company is under contract to perform. Included in the list are about 30 special lathes, several heavy duty machine planers, drill presses and other machine tools.

Government to Build Big Destroyer Plant

The biggest factor in the machinery market is the government project to build a $90,000,000 destroyer plant at Squantum, Mass., in conjunction with the Fore River Shipbuilding Corp. Forty-six destroyers will be assembled on berths to be constructed at this point. The Fore River corporation will construct a turbine and machine shop at Buffalo, and will build a boiler shop at Providence, R. I. The Aberthaw Construction Co., Boston, which has the general contract for the plant, has asked builders of locomotive cranes for figures on all the 10 to 50-ton cranes they possibly can supply. Orders have been closed for all angle and plate shop tools, including hydraulic equipment, punches, shears, furnaces, etc. It was planned to purchase the machine shop equipment this week. The navy department wants work actually to be started on the new destroyers within 12 weeks after the President signed the urgent deficiency appropriation measure, which was done on Oct. 6. It is expected the entire order will be completed within 16 months. William Cramp & Sons' Ship & Engine Building Co., Philadelphia, is inquiring for one locomotive crane, 20 to 25-tons capacity. The Westinghouse-Church-Kerr Co., New York, is in the market for one 15 to 20-ton locomotive crane. The Reading Foundry & Supply Co., Reading, Pa., is inquiring for a stationary crane. The Federal Shipbuilding Co., New York, which has a cargo ship contract and is co-operating with the American Bridge Co. in the construction of a shipyard in Newark Bay, N. J., has issued an inquiry for six 25-ton locomotive cranes. The Scranton Foundry & Engine Works, Scranton, Pa., will issue an inquiry for one large and one small overhead crane the latter part of this month. The Submarine Boat Corp., which has a contract for constructing a shipyard and fabricated steel cargo ships for the Emergency Fleet corporation in Newark Meadows, N. J., is inquiring for four 5-ton and one 15-ton electric traveling cranes.

Chicago Trade Grows Lethargic

COMPARATIVE quiet marks the machine tool trade in Chicago. October promises to be one of the dullest months of the year. Although the total amount of buying is less, most dealers note an increase of transient buyers, who take machines directly from the floors of dealers rather than to go through the formality of ordering from manufacturers. This course of procedure indicates an immediate and pressing need for equipment and its effect is to reduce stocks considerably. A general advance averaging about 10 per cent has been taking place for the past six weeks. Automobile manufacturers, for the most part, are not taking additional machinery, although one or two instances of exceptions have been noted. Some buying has been done by the government recently for machine shops in connection with aviation training camps, these machine tools, for the most part, being the usual light machine shop equipment. The Buda Co., which is engaged in making motors for an army truck manufacturer, is adding to its equipment. A recent demand on the market involved 100 sets of light tools for traveling machine shops to accompany aviation and machine gun divisions. Each set is to contain a lathe, a drill press, a gasoline furnace, a four-cylinder engine, an electric generator and a full equipment of hand tools. It is believed more business of this sort will come out shortly. The International Harvester Co., Chicago, is building a heat-treating department. The Ashland Light, Power & Street Railway Co., Ashland, Wis., is preparing to build a hydroelectric plant of 1200 horsepower nearly Hurley, Wis. The Star Machinery Co. at Seattle has bought additional grounds and will install cranes and other machinery. The Federal Steel & Mfg. Co., Minneapolis, will build three machine shops and a foundry in connection with its new plant.

Private Buyers Bolster Up Trade

INCREASED buying by private consumers of machinery and machine tools for the production of munitions for the government is the principal development reported from the Pittsburgh district

AGATHON Alloy STEELS

It's a long way from the sacred purifying fires of ancient Greece to the modern purifying open hearth alloy steel furnaces, but we have bridged the gap by adopting the Ancient Grecian ideal of perfection as expressed in the word "AGATHON"

"Agathon" Steels will serve your purpose best.

The Central Steel Company
Massillon, Ohio

Detroit Office: 326-27-28 Ford Bldg.
F. Walter Guibert, District Representative.
Cleveland Office: Hickox Bldg.
The Hamill-Hickox Co., District Representatives.
Chicago Office: Room 1370 People's Gas Bldg., 120 South Michigan Blvd.
A. Schaeffer, District Sales Manager.
Philadelphia Office: 603 Widener Building.
Frank Wallace, District Sales Manager.
J. E. Dockendorff & Co., General Export Agents, 20 Broad St., New York.

during the past week. Purchases of lathes have been particularly heavy. In all instances the earliest possible delivery has been urged and it is understood that despite the already well filled books of manufacturers, they are accepting new business and preparing to fill requirements for comparatively early shipment. These purchases by munition makers engaged on government contracts involve tremendous financial obligations, and compensation to the buyers will be made by the government itself. Inquiries coming from ordinary commercial interests are extremely limited and no sales of importance to this trade are reported. Prices being asked by makers remain unchanged, although it is generally conceded that in view of the government's price-fixing program as it affects the steel trade, levels have reached their highest point. Some take the view that a decline in prices may be expected soon. Private buyers in any case are unable to secure requirements for early delivery and this, coupled with the high prices, is keeping them out of the market, except in cases of most pressing needs.

Believe Great Buying Movement Impends

THAT another government buying movement is impending is the belief of several machine tool dealers in the Cleveland district. In the event that munition makers in Cleveland territory are successful in securing shell contracts now pending, it is anticipated that many large lists will be released. The government, it is authoritatively stated, has called several representative machine tool dealers into conference at Washington for the purpose of formulating a means of taking a census of all available machine tools, both new and second hand, as an expedient tending toward the solution of the problem of filling government needs as quickly as possible. No cessation has been observed in the buying of heavy equipment; inquiries far lathes having a swing of 20 inches and upward, heavy planers and other heavy tools still are current. A Detroit manufacturer is negotiating with a local dealer for 75 24-inch lathes. A Cleveland munition maker, it is anticipated, shortly will issue inquiries for several thousand dollars worth of equipment. The Warner & Swasey Co., Cleveland, is said to have secured a contract for approximately 30 machine tools from the Recording & Computing Machine Co., Dayton, O. The H. J. Walker Co., Cleveland, is working on an airplane-motor contract involving approximately $90,000 worth of pistons. The Machine Products Co., the V. R. Browning Co., both of Cleveland, and the Elyria Machine Co. are said to be negotiating for government shell work. The Akron Equipment Co., Akron, O., is in the market for a 36-inch x 24-foot lathe. An inquiry has been issued by the Port Arthur Shipbuilding Co., Port Arthur, Ont., for a 34 or 36-inch drill press. Requirements of the Pittsburgh Iron & Steel Foundries Co., Midland, Pa., comprise one 10,000-pound steam hammer and several heavy lathes. The Wine Railway Appliance Co., Toledo, O., is in need of a motor-driven dry grinder. The Grasselli Chemical Co., Cleveland, requests prices on an 8-inch pipe machine.

New Construction and Equipment

Concise and Timely Business Building Opportunities from the Field of Industry

Along the Middle Atlantic Seaboard

BUFFALO. — The Wire Wheel Co. of America contemplates constructing a plant here. H. F. Krause, Elmwood avenue, is manager.

ITHACA, N. Y.—The Morse Chain Works will build a 4-story plant addition.

ROCHESTER, N. Y. — The Bausch & Lomb Optical Co. has let the general contract for a 4-story plant addition, 120 x 400 feet, to the Turner Construction Co., 244 Madison avenue, New York.

YONKERS, N. Y.—The H. Schneider Co., 150 Downing street, New York, will construct two factory buildings at a cost of $40,000, to be 30 x 152 feet and 50 x 86 feet, respectively.

BELLEFONTE, PA.—The Titan Metal Co. which recently secured a large government contract for bronze, has begun the erection of an auxiliary plant. The first unit of the new plant, 60 x 200 feet, already has been commenced and two other structures, 50 x 150 feet respectively, are to be erected. The new plant will be in operation in two months.

FARRELL, PA.—The Farrell works of the American Sheet & Tin Plate Co. plans to erect a 2-story welfare building, 40 x 70 feet, for its employes, at a cost of $50,000.

PHILADELPHIA.—The Tacony Ordnance Co. has let a contract to the F. W. Mark Construction Co. for the erection of three manufacturing buildings to cost about $450,000.

PHILADELPHIA. — The Dobbins Core Drill Co. has been incorporated with $250,000 capital to make drills. The incorporators are: Roy T. Guthman, Reuban S. Baldwin and Thomas H. Dobbins.

PHILADELPHIA. — The Penn Chemical Works will build a power house addition, to cost $25,000. David Lutz, Bailey building, has the contract.

PITTSBURGH.—The American Coal, Iron & Coke Co. has been incorporated with a capital stock of $100,000 by C. N. Brady, William Atkinson, Nelson C. Hubbard, John P. Arbenz and M. E. Blatchley, Wheeling, W. Va.

PITTSBURGH. — The National Stamping Co. has been chartered with a capital stock of $5000. The incorporators are: John A. McGhee, E. K. Gans and N. C. Nugent.

PITTSBURGH.—The John Eichleay Jr. Co. has purchased a site in Hays borough, near the plant of the Mesta Machine Co. The purchase amounted to $49,980 and the company plans to build an erecting plant.

STOWE, PA.—The Stanley G. Flagg Co. will build a 1-story addition to its foundry and machine shop, to be 50 x 200 feet and cost $40,000.

CAMDEN, N. J.—The Merchants' Trust Co. has let a contract to Charles McCaul Co. for a two-story, 40 x 90-foot structure to cost $100,000.

COLLINGSWOOD, N. J.—The John J. McCloskey Co., manufacturer of cast steel looms, contemplates doubling the size of its plant.

ELIZABETH, N. J.—The American Metal Treatment Co. will build an addition to its plant on Broadway.

GLASSBORO, N. J.—The Owen Glass Co. is completing a $1,000,000 plant and will install considerable machinery. The new plant will be ready about Jan. 1.

HAMBURG, N. J. — The Wharton Steel

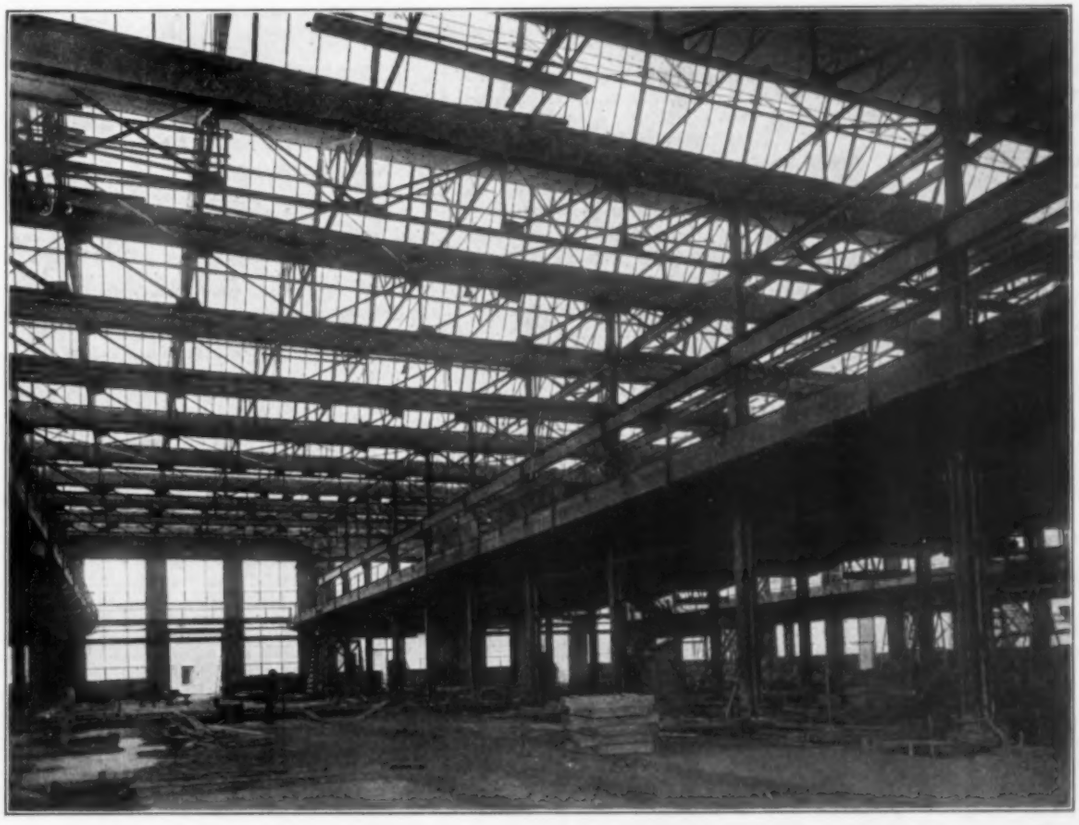
THE New Machine and Maintenance Shop of The Pullman Company, Pullman, Illinois, the first step in a reconstruction plan evolved from a comprehensive analytical survey made by The Arnold Company. The building shown was designed and constructed by

THE ARNOLD COMPANY

ENGINEERS—CONSTRUCTORS

ELECTRICAL—CIVIL—MECHANICAL

CHICAGO: 105 South La Salle Street NEW YORK: 111 Broadway



Say you saw it in THE IRON TRADE REVIEW

Co. has leased the limestone quarry of the Franklin Lime Co., and will install about $60,000 worth of new machinery.

JERSEY CITY, N. J. — The Pneumatic Concrete Machinery Co. has been chartered with $75,000 capital to manufacture conveying machinery. The incorporators are: W. A. Kitts Jr., Allen L. Story and Charles R. Allinson.

NEWARK, N. J.—The Erie railroad has had plans drawn for a passenger station, and other improvements to cost $875,000. Robert S. Parsons, Nutley, N. J., is chief engineer.

NEWARK, N. J.—The Hay Foundry & Iron Works, is having plans drawn for an addition to its plant on Plum Point lane to cost $7500.

NEWARK, N. J.—The Internal Combustion Co. has been chartered with $500,000 capital to manufacture and deal in motors and engines, by H. Y. Billings, David Henny, and D. S. Henny, Montclair.

PATERSON, N. J. — The Commonwealth Chemical Corp. will erect a plant on East Forty-third street to cost $100,000.

PASSAIC, N. J.—The New York Belting & Packing Co. will erect a 5-story addition, 84 x 250 feet, which together with other improvements, will cost about $250,000.

PERTH AMBOY, N. J.—The American Smelting & Refining Co., 120 Broadway, New York, has had plans drawn for a power plant addition, to be 60 x 70 feet in size.

PLAINFIELD, N. J.—The Niles-Bement-Pond Co. has let the general contract for a power house, 75 x 100 feet, to F. H. Banton, Twelfth and Lansome streets, Philadelphia.

TRENTON, N. J.—The Globe Rubber Tire Mfg. Co., Prospect street, has purchased a tract and will build an addition to its plant. J. S. Broughton is vice president of the company.

WEST ORANGE, N. J.—Thomas A. Edison Inc., Lakeside avenue, has had plans revised for a 1-story power house, 100 x 100 feet.

WILMINGTON, DEL. — The American Standard Metal Products Co. has been incorporated with $21,000,000 capital by C. L. Rimlinger, F. A. Armstrong and Clement M. Egner, Elkton, Md.

WILMINGTON, DEL.—The U. S. Tractor Corp. has been incorporated with $1,000,000 capital by F. D. Buck, M. L. Horty and K. E. Longfield.

WASHINGTON.—The Bureau of standards will take bids until Oct. 20 on an experimental sheet rolling mill.

WASHINGTON.—Bids will be received until Nov. 5 by the bureau of yards and docks, navy department, for fuel oil storage stations at Puget Sound, Mare Island, and San Diego, including pipes, pumps, boilers, heaters, buildings and reservoirs. Similar equipment also will be required for Pearl Harbor, Hawaii.

Trade Shows Activity

The Blaw-Knox Co., Pittsburgh, has closed its Boston office for the remainder of the war. Provision has been made to handle all business in the Boston district through the New York office, 165 Broadway.

The American Pulverizer Co., St. Louis, announces that it has removed its general and sales offices, factory and experimental laboratory to a new location at Eighteenth and Austin streets.

The Smiley Steel Co. announces that owing to its increased business it has removed its offices from 120 Broadway to larger quarters at 111 Broadway.

The Western Gas Engine Corp., Los Angeles, has changed its name to the Western Machinery Co.

Activities in the Central States

GRAND RAPIDS, WIS.—The Jackson Milling Co. will spend about $450,000 during the coming year in the construction of a new power dam and a power plant. W. E. Ule, Grand Rapids, has been selected as consulting engineer.

CHARLOTTE, MICH.—The Jordon & Steele Co., manufacturer of pumps, is building a factory. F. P. Town is president.

DETROIT.—The Detroit Hoist & Machinery Co., Marshton avenue, is building an addition.

DETROIT.—The Magnus Co., 22 Brush street, manufacturer of brass castings, is building a 1-story plant to cost $35,000.

DETROIT.—The Zenith Carburetor Co., Hart street, is building a 4-story addition.

DETROIT.—The McCord Mfg. Co., manufacturer of railroad supplies, will build a 1-story machine shop 40 x 80 feet. L. M. Hamlin, 2587 East Grand boulevard, is manager.

DETROIT.—The Henseler Trolley Mfg. Co., 363 Holden avenue, will build a 1-story machine shop and foundry. E. D. Fezzy is manager.

DETROIT. — The Chalkis Mfg. Co., 666 Mack street, manufacturer of airplane parts, is building a 1-story factory. A. G. Hansen is manager.

DETROIT.—The Packard Motor Car Co., Alvan Macauley, president, will build a heat treating plant 50 x 533 feet. Albert Kahn, 58 West Lafayette avenue, is the architect.

KALAMAZOO, MICH.—The Dunkley Co., 315 Eleanore street, M. E. Dunkley, manager, will build an office building and plant costing $35,000.

NEW HAVEN, MICH.—The Lapeer Truck Co. has bought a site and is preparing to erect a plant.

PORT HURON, MICH. — The Romeo Foundry Co. is about to erect an addition 90 x 200 feet to cost $200,000. Lyman A. Holem is president.

PETOSKEY, MICH.—The Petoskey Pump Co., manufacturer of rotary pumps, is building an addition 40 x 80 feet.

STURGIS, MICH.—The plant of the Van Buren Brass Foundry Co. has been burned with a $20,000 loss.

BELLEVILLE, ILL. — The United States Smelting Furnace has been incorporated with $50,000 capital by George B. M. Rogers, Arthur Jones, and J. W. Marsh.

CHICAGO.—The Interstate Brass Co. has been incorporated with $10,000 capital by M. L. Herman, A. L. Epstein, and Morris Landon, 1325 Turner avenue.

CHICAGO.—J. N. and P. Price, 215 West Randolph street, will build a machine shop costing $53,000 at 231 North Ashland avenue. Fagard & Knapp are the architects.

CHICAGO. — The Peerless Tool Co. is having plans prepared for a 1-story factory 50 x 120 feet. Arthur Foster, 230 South La Salle street, is the architect.

CHICAGO. — The International Harvester Co. has bought a tract of about 12 acres to provide for future plant extensions.

CHICAGO.—The Linde Tire Machine Co., 4849 West Grand avenue, is building a 2-story factory to cost $15,000.

CHICAGO.—The Mead Cycle Co., 33 North Canal street, is building an addition to its plant and will install about $20,000 worth of machinery.

CHICAGO. — The Hansell-Elcock Co. has bought a 50 x 125-foot site at Twenty-third place and Canal street adjoining its plant, to provide for future extensions.

CHICAGO.—The Union Specialty Machine Co., H. A. North, president, will build an 8-story factory 100 x 100 feet.

CHICAGO.—Swift & Co. will build an acid plant to consist of three 1-story buildings at Harvey, La., and cost $200,000. A fertilizer plant 200 x 400 feet at Hammond, Ind., to cost $250,000, also will be built.

CHICAGO.—The A. S. Ford Munitions Co. has been chartered in Delaware with $1,500,000 capital to manufacture guns by C. H. Dye, R. W. Plummer and H. A. Dickenson.

CHICAGO.—Plans will be ready for bids about Dec. 10 for the Calumet pumping station at 127th street and Indiana avenue. The plant will be 90 x 133 feet in size and cost about $2,000,000. H. I. Steffa, 818 South Michigan avenue, is the engineer.

CHICAGO. — The Raymond Bros. Impact Pulverizer Co., L. E. Raymond, president, 1319 North Branch street, will build a foundry addition 66 x 251 feet and boiler house 40 x 65 feet. Henry Raeder, 20 West Jackson boulevard, is the architect.

CHICAGO. — The Western Brass Mfg. Works has purchased a 75 x 174-foot site adjoining its plant to provide for extensions.

DECATUR, ILL.—Macon County commissioners are preparing plans for a steel bridge to cost $50,000.

HARVEY, ILL. — The Buda Mfg. Co., James Viles, president, 80 East Jackson boulevard, Chicago, will build a 4-story addition 80 x 260 feet.

PEORIA, ILL.—The Power Transmission Co. has been incorporated with $200,000 capi-

Interior of Turbine Shop for the General Electric Co., Schenectady, N. Y.

Austin Standard Buildings Delivered from Stock

WE hold for you today, in stock and under contract, the materials necessary for any building you may require that will approximate any one, or any combination, of our nine types of Austin Standard Factory-Buildings.

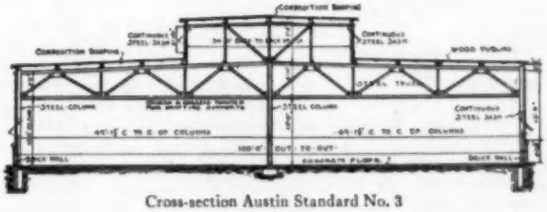
Subject to prior sale, we can erect on your property, complete, Austin Standard Buildings Nos. 1, 2 and 3 in 30 working-days from the date of your order. Nos. 4, 5, 6 and 7 can be delivered in 60 working-days. Other types in slightly longer time. We guarantee quality, cost, date of completion.

This is the longest building the General Electric Company ever built at one time at Schenectady. It is 860 feet long, 100 feet wide, with 86,000 square feet, built complete in 76 working-days after the order was signed, *4 days ahead of schedule.*

This is a revised No. 3 Austin Standard, with the entire roof system raised 10 feet and columns made heavier to allow for two 10-ton cranes.

The above view is centered on one bay, 50 ft. wide. Over 36,000 square feet of glass and only one column for every 2000 square feet of floor means well day-lighted, clear working floor area, dollars and cents in daily operation.

"Results, Not Excuses" is the slogan on the cover of the new *Book of Austin Buildings.* If you need a factory building of any kind it will pay you to send for this catalog.



Cross-section Austin Standard No. 3

The Austin Company

INDUSTRIAL BUILDERS

Cleveland, Ohio

Philadelphia	**New York**
Indianapolis	**Pittsburgh**
Jackson, Mich.	**Bridgeport, Conn.**

Export Representative: American Steel Export Co. Woolworth Building, New York

tal by Emil Kramer, R. V. Ralph and H. H. White.

ANDERSON, IND.—The Standard Plating Co., G. A. Robinson, manager, is building a foundry to cost $8000.

ANDERSON, IND.—Madison county commissioners are planning to build a 492-foot bridge over White River at Ninth street.

EAST CHICAGO, IND.—The George B. Limbert Co., Todd avenue, and 154th street, is building a 1-story pipe bending shop and boiler house to cost $11,000.

ELKHART, IND.—The Standard Ignition Co. has been incorporated with $200,000 capital to manufacture magnetos and other electrical devices by William H. Foster, E. B. Zigler and Andrew H. Beardsley.

FORT WAYNE, IND.—The city council is appropriating $100,000 for the State street bridge; $20,000 for the Fourth street bridge, and $40,000 for several small bridges.

HAMMOND, IND.—The Keith Car Co., 122 South Michigan avenue, Chicago, has bought 32 acres and will erect a plant to construct tank cars.

INDIANAPOLIS.—The Chilled Plow Co., 700 South Delaware street, will build an addition to cost $14,000.

INDIANAPOLIS.—The Indianapolis Cordage Co. has been incorporated with an authorized capitalization of $700,000 to engage in the manufacture of cordage and agricultural machinery. The directors are: Albert E. Scheithe, George R. Seeger, Ora D. Stoler, Charles E. Sullivan and Fred A. Doll.

INDIANAPOLIS.—The Stutz Motor Car Co. is preparing plans for a machine shop to cost about $40,000.

INDIANAPOLIS.—The Nordyke & Marmon Co. is preparing plans for the construction of additions to cost about $120,000.

INDIANA HARBOR, IND.—The Standard Forgings Co. will build several extensions, including a machine shop. About $200,000 has been provided for extensions.

LAFAYETTE, IND.—The Peerless Wire Goods Co. is rebulding two structures recently destroyed by fire at a cost of $25,000.

SOUTH BEND, IND.—The G. B. Cutter Co. is planning a 2-story addition to its factory. Davidson & Weiss, 53 West Jackson boulevard, Chicago, are the architects.

BUCYRUS, O. — The Bucyrus Steel Co. has been chartered with a capital of $50,000. The incorporators are: S. H. Tolles, W. T. Kinder, Ralph Burroughs, R. C. Hyatt and John M. Garfield.

CLEVELAND.—G. F. Mitchell & Sons Co. has purchased a 6-acre site and will erect a factory for the production of automobile fenders. The new plant is to consist of six units and will cost about $100,000.

CLEVELAND. — The Acorn Refining Co. has taken out a permit to build a 60 x 116-foot foundry building. The estimated cost of the new structure will be about $10,000.

CLEVELAND.—The Cleveland Switchboard Co. has taken a title to a parcel of land 120 x 180 feet and has taken out a permit for a $20,000 building.

COLUMBUS, O.—The Capital Die, Tool & Machine Co. has been chartered with $10,000 capital. R. B. Ralston, H. L. Gibney, J. B. Hoover, Thomas B. Flanagan and C. T. Warner are the incorporators.

DEFIANCE, O.—The Screw Machine Products Co. has let the contract for a 2-story addition. The Toledo Bridge & Crane Co. has the contract for the steel work.

HUNTINGTON, W. VA. — The Lamie Chemical Co. has been incorporated with a capital stock of $50,000 by Ralph D. Lamie, John Garvin, Alton T. Roberts, H. W. Shelton and Dan H. Ball, Marquette, Mich.

West of Mississippi

LOHRVILLE, IOWA.—The city council has made a $10,000 bond issue for the purpose of building a waterworks system.

KANSAS CITY, MO.—The B-B Mfg. & Drilling Co. has been incorporated in Delaware with $500,000 capital to manufacture bits, drills and other tools by Samuel J. Matthews, Edward L. Scott and A. M. Davis of Kansas City.

ST. LOUIS.—The Old Forge Landing Iron & Steel Co. has been incorporated with $50,000 capital by R. O. Smith, W. C. Kitchin and J. C. Pratt.

ST. LOUIS.—The Automatic Fender & Sales Co. has been organized to manufacture automatic automobile fenders by Walter W Simpson and Ernest Schober.

ST. LOUIS.—The Atlas Welding & Cutting Co. has been incorporated with $20,000 capital by Frank J. Bober, Q. W. Morrison, and Joseph Podkomorski.

ST. LOUIS.—The St. Louis Machine Tool Co., 2609 South Broadway, will build a 3-story machine shop 42 x 165 feet.

WILLIAMS, ARIZ.—A special election will be held soon to vote on $75,000 in bonds for a waterworks and electric light system. L. Stover is superintendent.

HOUSTON, TEX.—The International Marine Iron Works has been incorporated by Henry Piaggio, Gulfport, Miss., and E. C. Johnstone, Houston, the latter being general manager. The concern will build machinery for wooden ships.

HOUSTON, TEX.—The International Marine Iron Works, Inc., has been chartered with a capital of $25,000. Edward C. Johnstone, Stephen R. McCarthy and T. M. Kennerly are the incorporators.

HUNTER, OKLA.—An election will be held soon on issuing $125,000 in bonds for building a waterworks system.

OKLAHOMA, OKLA.—The Oklahoma Gas Generator Co. has been incorporated with $5000 capital to manufacture gas generators by E. H. Carter, E. E. Blake and E. A. Wales.

LA CROSSE, KANS.—A bond issue of $22,000 has been made for the purpose of building a waterworks system.

LAS CRUCES, N. MEX.—The Mammoth Wind Mill Mfg. Co. has been incorporated with $500,000 to manufacture wind mills by Zeno La Driere and Leroy Henry, Douglas, Ariz.

HAILEY, IDAHO.—An election will be held soon on the issuance of $90,000 in bonds for a waterworks system and power plant. J. Vernon is engineer.

POCATELLO, IDAHO. — Plans are announced by H. V. Platt, vice president and general manager of the Oregon Short Line for the expenditure of about $1,000,000 in constructing 40 miles of extensions in Southern Idaho and Northern Utah. Construction will be started at once.

WEISER, IDAHO.—The contract for the construction of a steel bridge across the Weiser river has been awarded to the Omaha Structural Steel Co. at $27,800.

Pacific Seaboard

TACOMA, WASH.—The Chicago, Milwaukee & Puget Sound railroad will build a substation for its line between Tacoma and Othello, Idaho, at a cost of $160,000. A. M. Ingersoll, assistant to the vice president, is in charge.

VANCOUVER, WASH.—Additions are to be made to the roundhouse and engine repair shops of the Spokane, Portland & Seattle railway. Two sections will be added to the roundhouse, and other improvements will be made at a total cost of $16,000.

ALBANY, OREG.—The county court is investigating the proposition of constructing a suspension bridge at Harrisburg on the Willamette river, at an estimated cost of $30,000.

GOLD HILL, OREG.—The city contemplates the installation of a $25,000 power plant for operating the city waterworks system.

MEDFORD, OREG. — The Utah-Idaho Sugar Co. has submitted a proposition to the Medford commercial club to construct a factory at a cost of about $750,000.

PORTLAND, OREG.—The Premier Engine Works has been incorporated with $200,000 capital to manufacture machinery by Charles B. Bailey, J. C. Pierce and A. C. Luetgert.

LOS ANGELES.—The Improved Valveless Pump Co. has been organized to establish a plant at 316 East Third street. Frank F. Ambrose is manager.

LOS ANGELES.—The American Aircraft Co. has been incorporated with $10,000 capital by H. S. King, Joseph Mattingly, and Roy Bauer.

Canada

HAMILTON, ONT.—The Canada Screw Co. has awarded the contract for the erection of an addition to its plant to cost $100,000. Construction work will be commenced immediately.

PERTH, ONT.—Henry K. Wampole & Co., Herriott street, have commenced the erection of a soap factory to cost $50,000. Boilers, engines, generators, etc., will be purchased for the plant by Stewart & Adams, care of the company.

TORONTO, ONT. — The Central Iron Works has been incorporated to manufacture machinery, iron, steel and castings with $100,000 capital by Arthur J. Thomson, William S. Morlock, Reginald H. Parmenter and others.

WALKERVILLE, ONT. — The Standard Foundry & Supply Co. has been incorporated to build and operate foundries, machine shops, etc., with $40,000 capital by Frederick S. Ferguson, Tom P. Charlton, Gordon Ross and others, all of St. Thomas.

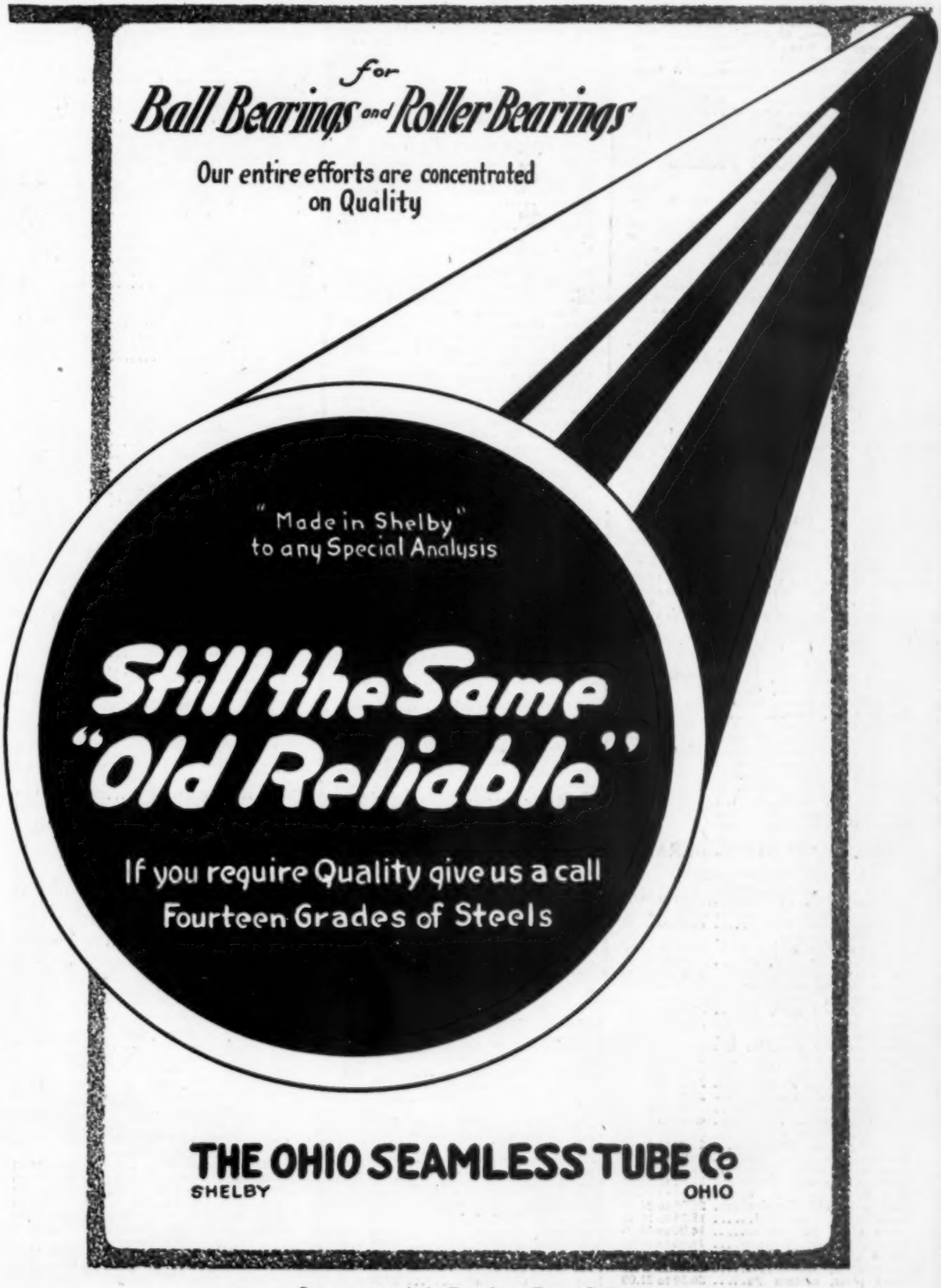
WESTON, ONT. — The Weston Water, Power & Light commission, has decided to increase the capacity of the machinery in its substation by installing three 100-kilowatt transformers.

New Catalogs

FURNACE ARCHES.—The M. H. Detrick Co., Chicago, recently published a bulletin devoted to flat suspended arches for furnaces and ovens. The booklet is well illustrated, many photographs of ovens and furnaces equipped with these arches being reproduced. The bulletin contains a partial list of users of this product.

GRINDING MACHINES.—A booklet devoted to ball bearing and plain bearing grinding and polishing machinery was recently published by the Webster & Perks Tool Co., Springfield, O. This catalog is of the loose leaf insert type, permitting additional leaflets to be inserted as they are distributed by the company. All leaflets are of the same type, the top half section being given over to illustrations of the particular tool described while the lower half presents the specifications. In a foreword, particular attention is called to a line of safety appliances and attachments among which are included plain and exhaust type wheel guards, spindle end guards, bevel safety flanges and others.

"OHIO SPECIAL"
Cold Drawn Seamless Steel Tubing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Ball Bearings and Roller Bearings
Our entire efforts are concentrated on Quality
"Made in Shelby" to any Special Analysis
Still the Same "Old Reliable"
If you require Quality give us a call
Fourteen Grades of Steels

THE OHIO SEAMLESS TUBE Co.
SHELBY OHIO

Say you saw it in THE IRON TRADE REVIEW

Iron and Steel Prices

Corrected to Tuesday Noon

IRON ORE

Superior Ores, Per Ton, Lower Lake Ports.	
Old range Bessemer, 55 iron	5.95
Mesabi Bessemer, 55 iron	5.70
Old range non-Bess., 51½ iron	5.20
Mesabi non-Bess., 51½ iron	5.05
Port Henry Ores, non-Bessemer, Per Unit,	
Delivered Eastern Pennsylvania.	
Old Bed, crude 55 iron	10.50c to 11.00c
Old Bed., concent., 65 iron	11.00c to 11.50c
Harmony, concent., 63 iron	11.50c to 11.75c
Lump (at mines)	$5.75

WAREHOUSE PRICES

Steel bars, Chicago	4.50c
Steel bars, Cleveland	4.50c to 5.00c
Steel bars, Detroit	4.50c
Steel bars, Philadelphia	5.00c to 5.50c
Steel bars, New York	4.75c to 5.00c
Steel bars, St. Louis	4.55c
Steel bars, Cincinnati	4.75c
Steel bars, St. Paul	4.60c
Steel bars, Buffalo	4.60c to 5.10c
Iron bars, Chicago	4.50c
Iron bars, Cleveland	4.45c to 4.95c
Iron bars, Detroit	4.50c
Iron bars, St. Louis	4.45c
Iron bars, Cincinnati	4.75c
Iron bars, Philadelphia	5.00c to 5.20c
Iron bars, New York	5.00c
Shapes, Chicago	5.00c
Shapes, Detroit	5.00c
Shapes, St. Louis	5.05c
Shapes, St. Paul	5.10c
Shapes, New York	5.00c to 5.25c
Shapes, Cleveland	5.00c to 5.25c
Shapes, Philadelphia	5.00c to 5.50c
Shapes, Buffalo	5.10c to 5.35c
Shapes, Cincinnati	5.15c
Plates, Chicago	7.00c to 10.00c
Plates, Detroit	**9.00c to 10.00c**
Plates, St. Louis	7.05c
Plates, St. Paul	**7.10c**
Plates, New York	8.00c to 10.00c
Plates, Cleveland	9.00c to 10.00c
Plates, Philadelphia	9.00c
Plates, Cincinnati	10.00c
No. 10 blue anl. sheets, Chi.	9.50c to 10.00c
No. 10 blue anl. sheets, Cleve.	8.50c
No. 10 blue anl., Buffalo	11.00c to 11.75c
No. 10 blue anl., sheets, St. L.	10.05c
No. 10 blue anl. sheets, Cinci.	10.00c
No. 10 blue anl. sheets, St. Paul	9.60c
No. 10 blue anl. sh., Detroit	9.50c
No. 28 black sheets, Chgo.	9.50c to 10.00c
No. 28 black sheets, Cleve.	8.50c
No. 28 black sheets, Cincin.	8.65c
No. 28 black, Detroit	**9.50c**
No. 28 black sheets, St. L.	9.25c
No. 28 black sheets, St. Paul	9.60c
No. 28 galv. sheets, Chgo.	11.00c to 11.50c
No. 28 galv. sheets, Cleve.	10.00c
No. 28 galv. sheets, Cincin.	10.65c
No. 28 galvanized, Detroit	11.00c
No. 28 galv. sheets, St. L.	11.05c
Hoops, Cleveland	6.00c
Hoops, Detroit	**7.00c**

IRON AND STEEL SCRAP

STEEL WORKS USE

(Gross Tons)

Bundled sheets, Pittsburgh	$23.00 to 24.00
Bundled sheets, Cleveland	23.00 to 23.50
Bundled sheets, Buffalo	19.00 to 20.00
City wrought, short, N. Y.	25.00
Frogs, switches, guards, St. L.	28.00 to 30.00
Heavy melting steel, Pitts.	30.00 to 31.00
Heavy melting steel, Buffalo	30.00 to 31.50
Heavy melting steel, Chgo.	27.00 to 28.00
Heavy melt'g steel, Cleveland	26.75 to 27.50
Heavy melting steel, Cinci.	25.50 to 26.00
Heavy melting steel, east. Pa.	25.00 to 27.00
Heavy melting steel, N. Y.	25.00
Heavy melting steel, St. L.	28.00 to 29.00
Heavy melting steel, Birming.	20.50 to 21.50
Hydraulic pressed sh't, Cleve.	25.00 to 25.50
Hydraulic press. sheets, Pitts.	24.00 to 26.00
Hydraulic pressed sh'ts, Chgo.	23.00 to 24.00
Low phos. steel, Buffalo	41.00 to 42.00
Low phos. steel, Pittsburgh	40.00 to 42.00
Low phos. steel, eastern Pa.	37.00 to 40.00
Shoveling steel, Chicago	25.00 to 26.00
Shoveling steel, St. Louis	26.00 to 27.00
Steel rails, short, Chicago	34.00 to 35.00
Steel rails, short, Cleveland	31.00 to 31.50
Steel rails, short, St. Louis	34.00 to 36.00
Steel rails, old, Birmingham	23.00 to 24.00
Stove plate, Cincinnati	15.50 to 16.00
Stove plate, St. Louis	14.00 to 16.00
Stove plate, N. J. points	18.50 to 19.00
Stove plate, Birmingham	17.00 to 18.00
Stove plate, Buffalo	20.00 to 21.00
Stove plate, eastern Pa.	20.50 to 21.00
Stove plate, Pittsburgh	20.00 to 21.00

(Net Tons)

Boiler plate, cut, No. 1, Chgo.	$17.00 to 18.00
Boiler plate, cut, No. 1, St. L.	15.00 to 16.00
Bundled sheets, Cincinnati	16.50 to 17.00
Knuckles, coup., Chicago	33.00 to 34.00
Knuckles, coup., St. Louis	34.00 to 36.00
Springs, Chicago	36.00 to 37.00
Stove plate, Chicago	16.75 to 17.75
Stove plate, Cleveland	19.00 to 19.50

Freight Rates, Pig Iron

Mahoning and Shenango valleys to:	
Cleveland	$0.95
Newark, N. J.	3.50
Boston	3.70
Philadelphia	3.30
Pittsburgh	.95
St. Louis	3.18
Minneapolis, St. Paul	4.54
Buffalo to:	
Albany, N. Y.	$1.26
New England (rail)	3.10
New York and Brooklyn (rail)	3.10
Virginia furnaces to:	
Boston docks (r. and w.)	$3.05
New England (all rail)	3.25
New York dock (r. and w.)	2.88
Birmingham, Ala., to:	
Cincinnati	$2.90
Chicago	4.00
Cleveland	4.00
Louisville, Ky.	2.65
Minneapolis, St. Paul	5.85
New York (r. and w.)	4.25
Philadelphia (r. and w.)	4.00
Pittsburgh	4.90
Savannah, Ga.	2.75
St. Louis	3.40
Chicago to:	
Des Moines	$2.80
Milwaukee	.50
Minneapolis, St. Paul	2.00
Moline, Ill.	1.40
Omaha	3.58
St. Louis	1.58
Ironton and Jackson, O., to:	
Chicago	$2.54
Cincinnati	1.26
Cleveland	1.62
Detroit	1.81
Indianapolis	1.58
Minneapolis, St. Paul	4.54
Duluth, Minn., to:	
Minneapolis-St. Paul	$1.25
Mayville, Wis.:	
Minneapolis-St. Paul	$1.75

Freight Rates, Finished Material

Pittsburgh, carloads, per 100 lbs., to:	
New York	19.5 cents
Philadelphia	18.5 cents
Boston	21.5 cents
Buffalo	16.0 cents
Baltimore	18.0 cents
Cleveland	13.5 cents
Cincinnati	17.0 cents
Chicago	20.5 cents
Detroit	15.7 cents
Minneapolis and St. Paul	32.9 cents
Denver	76.1 cents
St. Louis	23.6 cents
New Orleans	30 cents
Birmingham	45 cents
Pacific coast (all rail)	73.9 cents
Pacific coast (tin plate)	70 cents
Pacific coast, via Panama	61.0 cents

IRON MILL USE

(Gross Tons)

Busheling, No. 1, Buffalo	25.00 to 26.00
Busheling, No. 2, Buffalo	17.00 to 18.00
Busheling, No. 1, Pittsburgh	23.00 to 24.00
Cast borings, New York	17.50 to 18.00
Cast borings, eastern Pa.	19.00 to 20.00
Cast borings, Buffalo	19.00 to 20.00
Cast borings, Pittsburgh	20.00 to 20.50
City wrought, long, N. Y.	31.00 to 32.00
Forge flashings, small, Cleve.	23.50 to 24.00
Forge flashings, large, Cleve.	22.00 to 23.00
Forge No. 1 Eastern Pa.	21.00 to 22.00
Grate bars, Buffalo	20.00 to 21.00
Grate bars, N. J. points	18.50 to 19.00
Iron Axles, Pittsburgh	42.00 to 44.00
Iron axles, Cincinnati	42.50 to 43.00
Iron axles, eastern Pa.	50.00 to 55.00
Iron axles, Buffalo	45.00
Iron rails, Chicago	39.00 to 41.00
Iron rails, Buffalo	40.00 to 41.00
Iron rails, Cincinnati	32.00 to 32.50
Iron rails, St. Louis	36.00 to 38.00
Iron rails, Cleveland	40.00 to 40.50
Machine turnings, Buffalo	$17.00 to 18.00
Machine shop turnings, N. Y.	17.50 to 18.00
Mach. shop turnings, Pitts.	18.00 to 18.50
Mch. shop turnings, east. Pa.	18.00 to 19.00
Machine turnings, Birming.	10.50 to 11.50
R. R. mch. cast, No. 1, Buff.	30.00 to 31.00
R. R. wrought, 1, Buffalo	40.00 to 41.00
R. R. wrgt., No. 1, east. Pa.	40.00 to 43.00
R. R. wrought, No. 1, Pitts.	34.00 to 36.00
R. R. wrought, 1, B'ham	25.00 to 26.00
Wrought pipe, Buffalo	26.00 to 27.00
Wrought pipe, eastern Pa.	28.50 to 29.50
Wrought pipe, New York	25.00 to 26.00

(Net Tons)

Angle bars, iron, Chicago	$38.00 to 40.00
Angle bars, steel, St. Louis	26.00 to 27.00
Arch bars & transoms, St. L.	37.00 to 38.00
Arch bars & transoms, Chgo.	39.00 to 40.00
Busheling, No. 1, Chicago	21.00 to 22.00
Busheling, No. 1, Cincinnati	21.00 to 21.50
Busheling, No. 1, Cleveland	22.25 to 23.00
Busheling, No. 1, St. Louis	20.00 to 21.00
Busheling, No. 2, Chicago	14.00 to 15.00
Cast borings, Cincinnati	13.00 to 13.50
Cast borings, Cleveland	16.00 to 16.50
Cast borings, St. Louis	13.00 to 15.00
Cast borings, Chicago	15.50 to 16.00
Cut forge, Chicago	26.50 to 28.50
Grate bars, Cleveland	19.25 to 19.50
Iron axles, St. Louis	40.00 to 41.00
Iron axles, Chicago	42.00 to 43.00
Iron axles, Cleveland	44.00 to 45.00
Machine shop turnings, Chgo.	16.25 to 16.75
Mach. shop turnings, Cleve.	15.75 to 16.00
Machine shop turn'gs, Cinci.	13.00 to 13.50
Mach. shop turnings, St. L.	15.00 to 17.00
Pipes and flues, Cleveland	21.50 to 22.50
Pipes and flues, Chicago	17.50 to 19.50
Pipes and flues, St. Louis	18.00 to 19.00
Railroad wrought, 1, Cleve.	34.00 to 35.00
Railroad wrgt., No. 1, Chgo.	32.00 to 33.00
Railroad wrought, 1, Cinci.	28.50 to 29.00
Railroad wrought, 1, St. L.	32.00 to 34.00
Railroad wrgt., No. 2, Chgo.	27.50 to 28.50
Railroad wrought, 2, St. L.	30.00 to 32.00

IRON OR STEEL WORKS USE

(Gross Tons)

Axle turnings, Cleveland	$23.00 to 24.00
Axle turnings, Buffalo	26.00 to 27.00
Shafting, New York	36.00
Shafting, eastern Pa.	40.00 to 45.00
Steel car axles, Birmingham	32.00 to 33.00
Steel car axles, New York	47.00 to 48.00
Steel car axles, Buffalo	45.00
Steel car axles, Cleveland	47.00 to 48.00
Steel car axles, Pittsburgh	44.00 to 46.00
Steel car axles, eastern Pa.	50.00 to 55.00

(Net Tons)

Shafting, St. Louis	35.00 to 37.00
Steel car axles, St. Louis	40.00 to 42.00
Steel car axles, Chicago	41.00 to 42.00

IRON FOUNDRY USE

(Gross Tons)

Car wheels, (iron), Pitts.	30.00 to 31.00
Car wheels, (steel), Pitts.	33.00 to 35.00
Car wheels, eastern Pa.	30.00 to 31.00
Car wheels, Buffalo	30.00 to 31.00
Car wheels, New York	
Car wheels, St. Louis	30.00 to 32.00
Car wheels, Birmingham	22.50 to 23.50
Car wheels, Cleveland	26.00 to 26.50
Tram car wheels, Birming.	19.50 to 21.00
Cast, No. 1, Birmingham	22.50 to 23.50
Cast, 1, machy., N. J. points	32.00 to 33.00
Cast, 1, heavy, N. J. points	30.00
Cast, No. 1, eastern Pa.	28.00 to 30.00
Cast, No. 1, Pittsburgh	28.00 to 29.00
Malleable railroad, Cincinnati	20.50 to 21.00
Malleable railroad, Cleveland	27.00 to 27.50
Malleable railroad, Buffalo	29.00 to 30.00
Malleable railroad, Pittsburgh	28.00 to 29.00
Malleable railroad, east. Pa.	30.00 to 32.00

(Net Tons)

Cast No. 1, Cleveland	22.50 to 23.50
Cast, No. 1, Chicago	23.00 to 24.00
Cast, No. 1, Cincinnati	23.00 to 23.50
Cast, No. 1, St. Louis	22.00 to 23.00
Malleable railroad, Chicago	27.00 to 28.00
Malleable railroad, St. Louis	26.00 to 27.00
Malleable agricultural, Chgo.	23.00 to 24.00

MISCELLANEOUS USES

(Gross Tons)

Reroll. rails, 5 ft. & ov., Pitts.	$34.00 to 36.00
Reroll. rails, 5 ft. & ov., Chgo.	35.50 to 36.00
Reroll. rails, 5 ft & ov., E. Pa.	28.00 to 32.00
Reroll. rails, 5 ft. & ov., St. L.	40.00 to 42.00
Reroll. rails, 5 ft. or ov., Cleve.	38.00 to 39.00
Rerolling rails, long, Birming.	37.50 to 38.50

(Net Tons)

Boiler punchings, Chicago	32.00 to 33.00
Locomotive tires, Chicago	34.00 to 35.00
Locomotive tires, St. Louis	37.00 to 38.00